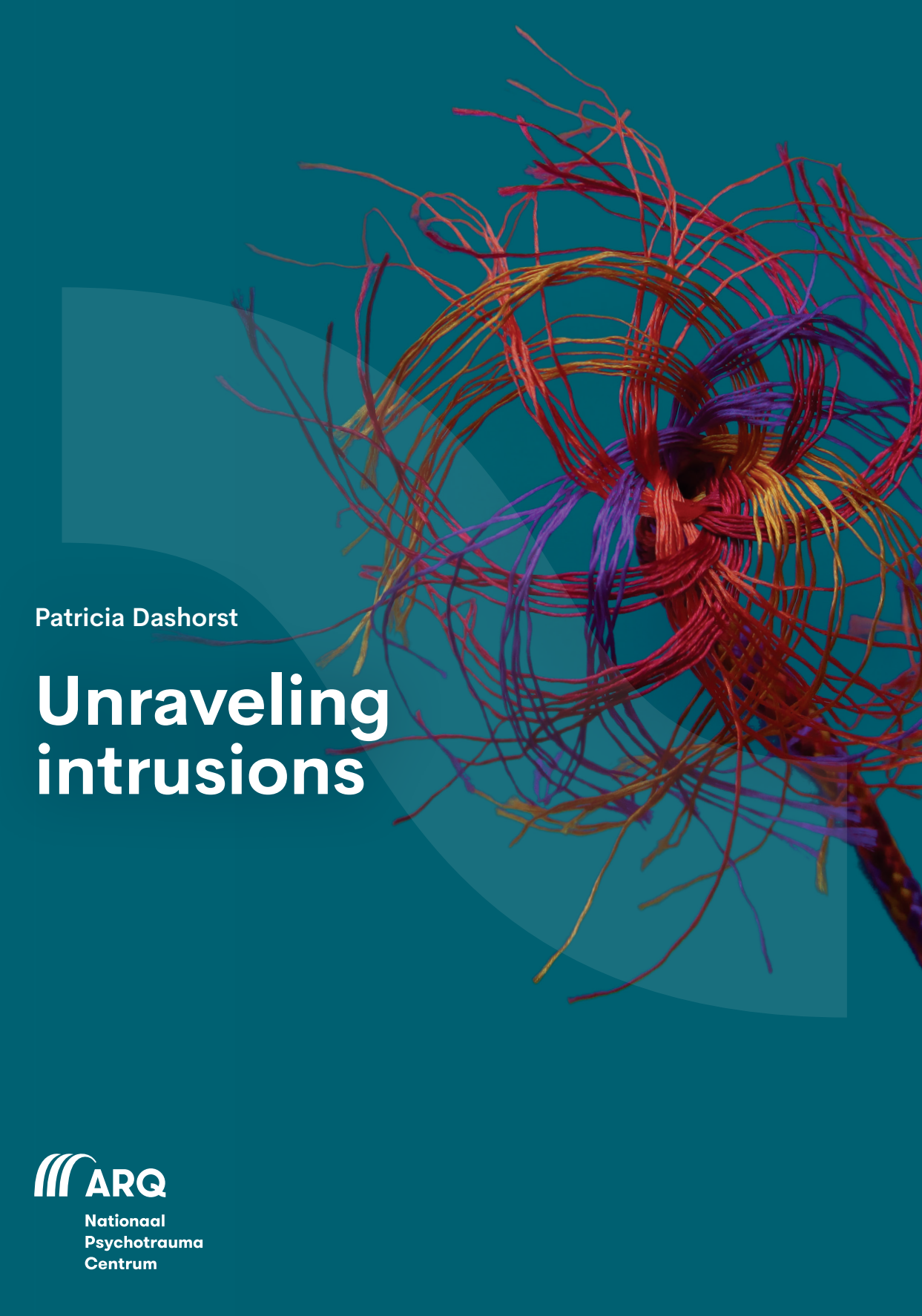

Patricia Dashorst

Unraveling intrusions

ARQ
Nationaal
Psychotrauma
Centrum

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Psychotrauma
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Dit boek is een uitgave van ARQ Nationaal Psychotrauma Centrum en maakt deel uit van de ARQ boekenreeks.

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Unraveling intrusions

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PREFACE

By a felicitous coincidence, the defence of the PhD thesis before you takes place in the 50th anniversary year of ARQ Centrum'45, the institute originally founded for the treatment of first-generation World War Two survivors, while the focal point of this study, in part conducted at that institute, concerns the offspring of these survivors, collectively known as the postwar or second generation. How these children, born after the war, can still be affected by the traumatic experiences of their parents constitutes the central research question posed by author Patricia Dashorst, a psychiatrist, family therapist as well as a researcher at ARQ National Psychotrauma Centre. This intergenerational study not only brings together her two particular areas of expertise, psychotraumatology and family therapy, but is also the result of the fruitful collaboration between Groningen University's Clinical Psychology and Experimental Psychopathology department and ARQ Centrum'45.

The specific intergenerational consequences of trauma focused on here pertain to the phenomenon of intrusions: recurring memories in the shape of images or thoughts that recall shocking events such as violence or war and that are often highly distressing for the person experiencing them. Intrusions may be of two kinds: direct intrusions are memories of events individuals have experienced themselves, while indirect intrusions refer to non-self-experienced events. In the qualitative and quantitative studies she conducted, Dashorst set out to investigate how both types of intrusions can be accounted for scientifically and what memory processes and possible other factors are involved in the retrieval of such memories. Given that most theoretical models fail to explain the incidence of indirect intrusions, Dashorst turns to an alternative – the mnemonic model – that focuses on how memories are stored, retrieved, re-stored and, in the process, reconstructed.

Her investigation into the intrusions experienced by this survivor offspring population group not only shows that the second generation does indeed experience intrusive memories of events witnessed by the parent generation; in fact, indirect intrusions proved particularly prevalent in the patient sample involved. Moreover, when the indirect and direct intrusions were compared, they were found to closely resemble each other as to their often gruesome nature, intensity, frequency and uncontrollability. In other words, children of survivors of war and persecution are affected by what their parents have been through, not only in the form of psychological problems, but also, it now transpires, in the form of indirect intrusions.

These findings naturally have implications for clinical practice: the author urges professionals to be alert to the fact that patients who have not first-hand experienced

a traumatic event may still be affected by the event their parents witnessed. Further, a similar alertness should be extended to the children of survivors of wars other than the Second World War, or even of other types of violence. There is no reason to believe that the offspring of survivors of wars waged in, for instance, Afghanistan, Syria or Ukraine are in any way protected against this long-term, intergenerational impact of trauma, Dashorst warns.

We welcome this study as an important contribution to our knowledge of the intergenerational nature and impact of psychotrauma. It provides a scientific foundation for our understanding of intrusions and, more in general, of the workings of memory itself.

Jan-Wilke Reerds MBA
Chair Board of Directors ARQ National Psychotrauma Centre

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CHAPTER 1

General introduction

Fifteen years ago, a woman who was in her forties at the time was referred for psychotherapy because of her ongoing mood swings, anxiety, low self-esteem, and feelings of worthlessness and loneliness. I was struck by her story. Her mother had been seriously maltreated in a Japanese internment camp and, as a result, had developed post-traumatic stress disorder with nightmares. She often felt and behaved as if the war was still happening. For these posttraumatic nightmares and flashbacks, her mother had received intensive psychotherapeutic treatment. As teenagers, my client and her brother and sister were asked by their mother's psychotherapist to join a treatment session. They told the therapist that when their mother had nightmares she was anxiously screaming and forced the children to hide in the basement. This happened almost every night. This basement became a terrifying room for them. They were afraid of the anxious and sometimes verbally and physically violent behavior of their mother. The children hoped the therapist would listen to their stories of the frightening nights and help them. However, after that single session where they conveyed about the situation at home, the therapist nor others asked about the needs and distress of the children – they took care of their mother only. As a result, my client felt abandoned. She learned that she had to take care of herself. And she did so, until she had the feeling she could no longer cope with life. She was overwhelmed with intense negative emotions, felt desperate and decided she had to figure out why nobody had seen the awful situation they had lived in. She suffered from intrusions related to the anxious nights in the basement. During therapy, gradually, she started talking about her intrusions of the maltreatment of her mother by a Japanese soldier. Obviously, these were not her own experiences as she was born after the war had ended. Nevertheless, she reported vivid recollections of war-related experiences that probably reflected the dreadful experiences of her mother in the Japanese internment camp.

Intrusions are involuntary, spontaneously arising images or thoughts often present after shocking events such as violence, disasters, or war. Most victims have these intrusive memories for a limited period. For other victims, intrusions persist or appear later in life as intrusive memories, flashbacks, or nightmares, which are symptoms of posttraumatic stress disorder (PTSD) (DSM-5; American Psychiatric Association, 2013). Intrusions, as part of PTSD, tend to be repetitive, uncontrollable, and distressing: events are vividly re-experienced with a `here and now' quality (Berntsen, 2010; Brewin et al., 2010). Retrieval of intrusions is unintentional and provoked by triggers. These triggers are reminders such as emotional, physical (e.g., heart rate, body temperature, blushing, pain), and situational (e.g., sight, sound, smell) cues temporarily associated with the event. Triggers are personal and may differ even among people who have been in the same situations.

Intrusions of traumatic events can refer to a 'hotspot' (the most frightening or dangerous part of the event), a 'warning signal' (the part of the event which precedes

the most terrifying or dangerous part), or a 'flashforward' (the expected ending of the traumatic event, what would have happened if.....) (Ehlers & Clark 2000, 2002, 2004; Holmes et al., 2007). Apart from PTSD, individuals with other emotional disorders, such as general anxiety disorder, obsessive-compulsive disorder, addiction, and suicidality, can also experience intrusions (Berntsen, 2010; Brewin, 2007, 2010; Holmes et al., 2007). Moreover, clinical studies have shown that intrusions may not only appear after personally experienced or witnessed traumatic events. Intrusions have been reported, for instance, among individuals whose loved ones were the victim of severe burn injuries or the victim of murder. Further, such indirect "empathic" intrusions are also reported by (para)medics after treating traumatized patients. Typically, the person having the intrusions was not present during the traumatic event (Celia et al., 1988; Michael et al., 2016; Rynearson & McCreery, 1993). Another example from clinical practice is the son of a Holocaust survivor reporting frightening intrusions with detailed images of children dying in gas-chambers.

THEORETICAL MODELS OF INTRUSIONS

Most theoretical models explaining intrusions of traumatic events have been formulated in the context of PTSD. These models start with the premise that people with PTSD personally experienced or directly witnessed the traumatic event. Intrusions, consequently, result from the anomalous way traumatic events are encoded in memory compared to non-traumatic events. However, because of their focus on aberrant memory encoding of self-experienced traumatic events, these models cannot explain intrusions about traumatic events which are not personally experienced or witnessed.

As is illustrated by Figure 1 (Rubin et al., 2008b), voluntary and involuntary retrieval of memories of both traumatic and non-traumatic events may occur by people with as well as by people without symptoms of PTSD. According to Rubin and colleagues (2008b), existing models of PTSD only explain the voluntary and involuntary retrieval of traumatic events by people with PTSD. They do not, however, explain the involuntary retrieval of traumatic events in the absence of PTSD. Nor do they explain the involuntary retrieval of non-self-experienced traumatic and non-traumatic (but emotional) events. Therefore, Rubin, Berntsen, and colleagues developed an alternative model, *the mnemonic model* (Rubin et al., 2008a, 2008b). This model is not based on a so-called *special mechanisms view*, which represents cognitive theoretical models developed in the context of PTSD to understand its clinical symptoms (e.g., Brewin, 2007; Ehlers & Clark., 2000). The basic assumption of such trauma-models of intrusions is that there are special mechanisms that explain the encoding and retrieval of traumatic memories as compared to non-traumatic memories. In contrast, the mnemonic model is based on a 'basic mechanisms' view, which originated not from the clinical field but from

naturalistic and experimental research on memory in the general population in order to provide a broad understanding of memory processing, including memory for highly emotional events (Dalgleish, 2004; Rubin et al., 2008b). The mnemonic model does not require to differentiate between traumatic events and other types of emotional events to explain the occurrence of intrusions related to personally witnessed traumatic events (e.g., Rubin et al., 2008b. Applying the mnemonic model to intrusions in PTSD, intrusions are seen as a product of the current memory of a self-experienced traumatic event and an individual's characteristic memory processes. This dissertation goes one step further in that it applies this model in order to also explain the occurrence of intrusions related to events that people did not experience themselves.

More specifically, the studies described in this dissertation, were designed to help understand the occurrence of intrusions in children about their parents' horrible experiences in World War Two, as reported by the woman whose experiences were described in the first paragraph of this chapter. In addition to intrusions about the anxious nights in the basement, she reported intrusions reflecting images of her mother being beaten and sexually assaulted by a Japanese soldier. She said: "it is very strange what is going on sometimes; some moments I almost feel the pain of my mother and I need to protect her, but I am powerless".

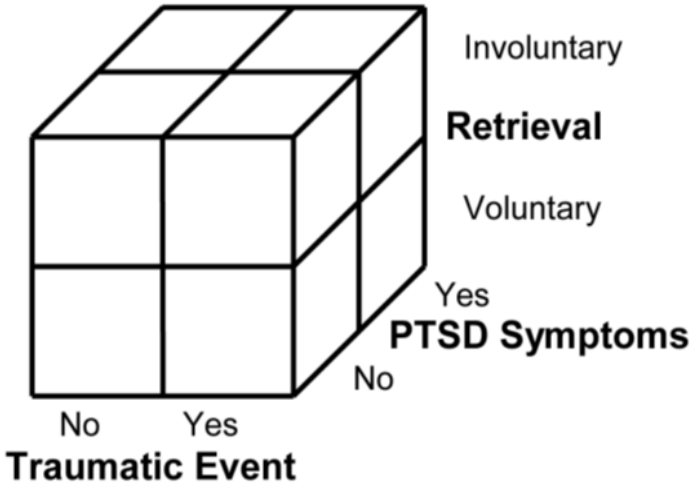

Figure 1 Representation of the relation between event, PTSD, and retrieval (Rubin et al., 2008b)

In the next section, both the special mechanism view and the basic mechanism view, will be described followed by a detailed description of the mnemonic model. Subsequently, the sample under study in this dissertation will be introduced.

Special mechanisms view

The special mechanisms view assumes that memory processes (i.e., encoding and retrieval) involved in traumatic events are specific to these events and are not involved in the processing of non-traumatic events. For example, the cognitive model by Ehlers and Clark (2000) assumes that the encoding of a traumatic event is data-driven with a major role for sensory impressions and influenced by peri-traumatic factors, such as peritraumatic dissociation experienced by the victim. In this model, trauma-related cognitive strategies, such as negative appraisal of the traumatic event, poor elaboration of the trauma memory, and inadequate integration of traumatic events into an individual's autobiographical memory base, contribute to the development and maintenance of intrusions (Ehlers & Clark, 2000). The data-driven, sensory impression processing of trauma memories can be poorly discriminated from other memories and, therefore, impairs discrimination between trauma and non-trauma-associated cues.

Another model sharing this perspective is Brewin's dual representation theory (Brewin, 2007; Brewin & Holmes, 2003). This theory is based on the principle that verbally and situationally accessible memory systems specifically operate during the encoding and retrieval of traumatic events. Normally, the verbally accessible part of a memory of a traumatic event is integrated with autobiographical memories and can be retrieved intentionally. These memories are represented as a (more or less) complete story with personal context of past, present, and future, and are available for verbal communication. However, situationally accessible memories of a traumatic event contain memories of short unnoticed sensory parts of the scene that could not be integrated verbally. Therefore, these memories are not integrated into autobiographical memory (yet) and their retrieval occurs unintentionally and will be provoked by triggers, i.e., cues, personal reminders, associated with the traumatic event.

Both models share several principles: a) peritraumatic processes (e.g., dissociative experiences) affect the encoding of traumatic events, which are insufficiently integrated into context (i.e., time and place), b) these aberrant memory processes result in inadequate incorporation of the trauma memory in a person's autobiography, c) the lack of integration renders these memories highly sensitive to involuntary retrieval and at the same time hamper voluntary retrieval. However, as these aberrant memory processes (a, b) operate at the time of encoding (and are thus characteristic of traumatic events), they cannot explain the occurrence of intrusions referring to indirectly experienced traumatic events (i.e., events that individuals did not experience/ witness themselves).

Basic mechanisms view

In contrast to the 'special mechanisms view', the basic mechanisms view is more parsimonious as it assumes that the same general memory mechanisms are available

for the encoding and retrieval of traumatic and other negative emotional events. Involuntary and voluntary retrieval in this view only relate to differences in retrieval from the same memory system. The model assumes that emotional arousal enhances (rather than disrupts) encoding and helps the formation of highly available memories, both voluntarily and involuntarily (Rubin et al., 2008a, 2008b). Moreover, the *mnemonic model* presumes that besides emotional arousal, several other individual differences factors influence the encoding and retrieval of the memory. Among these factors are, for example, demographic and personality characteristics (e.g., neuroticism may affect the impact of an event by an increased focus on negative aspects of the event and the tendency to react with intense emotions). The central role of the event per se is replaced in this model by the event as reconstructed in memory, thereby stressing the active role of pre-disposing factors that may influence the encoding and the event as constructed retrospectively. The interplay of these factors not only affects memory retrieval, but also the rehearsal, and in turn, the re-encoding of the memory, resulting in a memory that changes over time (Berntsen, 2010). Relatedly, the mnemonic model postulates that not the traumatic event itself but the memory of the event elicits post-traumatic symptoms. Evidence for this hypothesis can be found in studies reporting that experiences later in life may contribute to experiencing an event as traumatic in retrospect years later (Engelhard et al., 2019). Likewise, childhood traumatic events might at first not be experienced as a traumatic event but may eventually evolve as a traumatic memory. If, for example, an adult suffering from feelings of confusion or anxiety may retrospectively reinterpret the events experienced in childhood as traumatic, whereas, in childhood, the events were not experienced or recognized as traumatic.

The central thesis of the current dissertation project is that the (re)constructive processes as explained in the mnemonic model, can also be at play in the *construction* of (intrusive) memories related to events not personally experienced or witnessed. Post-World War Two born survivor offspring are a population par excellence to investigate this claim, as they may have intrusions about a war they have never experienced themselves.

MENTAL HEALTH IN OFFSPRING OF WORLD WAR TWO SURVIVORS

Even more than seventy-five years after World War Two, the consequences of this mass violence in daily life of the survivors are still present. Oral history by survivors and results from medical, psychological, and psychobiological research have shown that the cruelty of the German and Japanese occupation impacted survivors' lives with intense feelings of personal distress and posttraumatic stress symptoms (Bramsen & van der Ploeg, 1999; Mooren & Kleber, 2013). Examples can be found in the writings of, for example, Eddy de Wind, Gerard Durlacher, Viktor Frankl, Hans Keilson, Primo Levi, and Louis Tas, all authors of biographical documents about their own experiences in German concentration camps. They described their observations of the behavior of other 'KZ-Häftlinge' (prisoners) and guards and combined their own stories and observations with their professional knowledge as a psychiatrist or scientist. Their aim was to help understand how the atrocities affected their life and that of other survivors' lives.

Survivors and their offspring

Besides direct trauma-related consequences for those who survived World War Two, the cruelty and violence of war may also have influenced their offspring (Betancourt, 2015; Danieli, 1998; Havinga et al., 2017). Many years after World War Two, survivor offspring still experienced their parents' war as present in their daily life. World War Two survivors, specifically Holocaust[1] survivors and their offspring, have been a population of particular research interest for years. Researchers agree that while precise mechanisms of intergenerational processes of trauma have been largely unknown, the awareness has raised that, for example, offspring of the Holocaust experienced emotional problems because of their difficulties with coping with their parents' responses to the war (Danieli, 1998, 2016, 2017; Kellermann, 2001, 2008; Van IJzendoorn et al., 2003). Specifically, the survivors' thoughts, feelings, and behaviors related to their experiences may impact their offspring's emotions and behavior (Fonagy, 1999; Kretchmar & Jacobovitz, 2002; Munroe et al., 1995).

Posttraumatic symptoms and PTSD can be seriously disabling and impacting functioning in daily life as a partner or parent (Greenblatt-Kimron et al., 2021; Leen-Feldner et al., 2013). As is the case for psychotic and mood disorders, PTSD is a severe mental illness that may be associated with mental health problems in offspring. These include mood and anxiety (internalizing) symptoms and behavioral (externalizing) problems (Leen-Feldner et al., 2013; Schreier et al., 2006). Parental PTSD is also associated with epigenetic alteration and altered hypothalamic-pituitary-adrenal (HPA)-axis functioning (Leen-Feldner et al., 2013). Moreover, both the mental health problems of these parents and their offspring may interfere with the quality of the parent-child relationship (Christie et al., 2019; Van Ee et al., 2013). More specifically, parental posttraumatic stress symptoms include a diminished ability of emotion regulation as well as responsiveness and attenuation to the child's basic needs. These

1 Although the German occupation during World War Two affected many people, most, if not all, psychological research on the intergenerational consequences of World War Two focused on Holocaust survivor offspring. Therefore, less is known about offspring who had to cope with parents who survived other World War Two conditions. A few examples are soldiers, members of the liberation army, survivors of the Japanese internment camps in the Dutch East-Indies and elsewhere in Southeast Asia, those persecuted for religious or political reasons, and those who experienced forced labor.

symptoms can lead to irritability and numbing, as well as emotional and physical abuse and (emotional) neglect of their children (Lehrner & Yehuda, 2018; Yehuda et al., 2007). In addition, the child may also be less responsive because of symptoms of anxiety, depression, and behavioral problems (Shmotkin et al., 2011; Van Ee et al., 2012).

The intergenerational consequences of World War Two have often been defined as a "transmission" of trauma. Community studies on Holocaust survivor offspring and on offspring of survivors of the Japanese occupation in the Dutch East Indies during World War Two have not found evidence for a 'survivor offspring disorder'. That is, these studies revealed an equivalent prevalence of mental health problems compared to non-survivor offspring (Bar-On et al., 1998; Brom et al., 2001; Eland et al., 1990; Felsen, 1998; Kellermann, 2001; Solomon, 1998; Van der Velden et al., 1994; Van IJzendoorn et al., 2003). However, in *clinical* samples of offspring of World War Two and among offspring of parents with PTSD related to other traumatic events, mental health symptoms (in)directly related to their parent's traumatic experiences and psychopathology have been observed (Greenblatt-Kimron et al., 2021; Leen-Feldner et al., 2013).

THE PRESENT STUDY

The studies in this dissertation used both quantitative and qualitative methods to investigate intrusions in a clinical population of World War Two survivor offspring. There are clinical indications that World War Two survivor offspring (born after 1945) have intrusions about the war experienced by their parents (Braga et al., 2012). This is in line with Harris (2020), who stated that survivor offspring are highly involved in their parents' memories of their traumatic war events, resulting in these parental experiences becoming part of the offspring's memories.

The aim of this project is to enhance insight into the occurrence of intrusions and to gain further understanding of contributing personal factors. This dissertation is guided by answering the following research questions. All studies were conducted in a clinical sample:

- Does World War Two survivor offspring experience intrusions referring to non-self-experienced traumatic events (indirect intrusions)? If so: How do the characteristics of such indirect intrusions compare to characteristics of intrusions referring to self-experienced traumatic events?
- What type of participant characteristics are associated with either kind of intrusion?
- What is the content of participants' World War Two-related indirect intrusions?

General outline of this dissertation

Chapter 2 presents a systematic review of the research on the intergenerational consequences of World War Two. An overview will be given of the characteristics of Holocaust survivors and the impact of the Holocaust on their offspring's mental health.

Chapters 3 to 5 encompass the results of an empirical study on intrusions in World War Two survivor offspring: *Chapter 3* addresses the occurrence, frequency, and characteristics of intrusions referring to parental World War Two experiences in a clinical population of World War Two survivor offspring and compares these features of indirect intrusions to those of intrusions related to personally experienced events.

Chapter 4 reports on a qualitative thematic analysis of the content of the offspring's indirect intrusions referring to World War Two to provide an in-depth understanding of the themes impacting the mental health of offspring.

Chapter 5 is an empirical study using quantitative instruments. It focuses on individual characteristics related to the presence of direct and indirect intrusions.

Chapter 6 summarizes the main findings of the studies in this dissertation and integrate the core findings with attention for important leads for future research and clinical implications.

CHAPTER 2

Intergenerational consequences of the Holocaust on offspring mental health: A systematic review of associated factors and mechanisms

Based on:
Dashorst, P., Mooren, T. M., Kleber, R. J., de Jong, P. J., & Huntjens, R. J. C. (2019). Intergenerational consequences of the Holocaust on offspring mental health: A systematic review of associated factors and mechanisms. *European Journal of Psychotraumatology, 10(1),* 1654065.

ABSTRACT

Background

Exposure to war and violence has major consequences for society at large, detrimental impact on people's individual lives, and may also have intergenerational consequences. To gain more insight into these intergenerational consequences, research addressing the impact of the Holocaust on offspring is an important source of information.

Objective

The aim of the current study was to systematically review the mechanisms of intergenerational consequences by summarizing characteristics in Holocaust survivors and their offspring suggested to impact the offspring's mental health.

Methods

We focused on: 1) parental mental health problems, 2) (perceived) parenting and attachment quality, 3) family structure, especially parental Holocaust history, 4) additional stress and life events, and 5) psychophysiological processes of transmission.

Results

We identified 23 eligible studies published between 2000 and 2018. Only Holocaust survivor studies met the inclusion criteria. Various parent and child characteristics and their interaction were found to contribute to the development of psychological symptoms and biological and epigenetic variations.

Conclusion

Parental mental health problems, perceived parenting, attachment quality, and parental gender appeared to be influential for the mental well-being of their offspring. In addition, having two survivor parents resulted in higher mental health problems compared to having one survivor parent. Also, there was evidence suggesting that Holocaust survivor offspring show a heightened vulnerability for stress, although this was only evident in the face of actual danger. Finally, the results also indicate intergenerational effects on offspring cortisol levels. Clinical and treatment implications are discussed.

INTRODUCTION

War and violence have been part of human history. Nowadays more than 65 million people around the world have been forced to leave home as a result of armed conflicts; more than 21 million of them are refugees of whom more than half younger than 18 years of age (www.UNHCR.org). Exposure to war and violence not only has major consequences for society at large but also has detrimental impact on people's individual lives. Besides trauma-related psypsychopathology of those exposed, violence and war may also have intergenerational consequences (Betancourt, 2015; Danieli, 1998; Havinga et al., 2017). The term 'transmission' of trauma has been used to describe these consequences, defined as thoughts, feelings, and behaviours generated from the survivors' experiences and transmitted to their offspring (Fonagy, 1999; Kretchmar & Jacobovitz, 2002; Munroe et al., 1995). While some definitions describe similar symptoms for survivors and their offspring, other describe a more indirect process, through which, consciously or unconsciously, the experiences of the earlier generation influence (first and second generation) parenting attitude and behaviour (Baider et al., 2000; Van IJzendoorn & Schuengel, 1996). A better understanding of the inter-generational impact of violence and war is important not only from a theoretical perspective but also paramount for generating ideas for (more) effective interventions to help minimize these consequences in survivors of war.

While empirical research on the intergenerational consequences of violence and war focused mainly on offspring of Holocaust survivors, exceptions have also considered other violence-stricken populations such as refugees and survivors of repressive regimes and torture (Bloch, 2018; Sangalang et al., 2017; Sangalang & Vang, 2017). Methodologically, this field has evolved from clinical case studies in the 1960s to descriptive patient group studies in the seventies, and to studies including clinical and non-clinical groups in the eighties and nineties (Danieli, 1998; Solkoff, 1981, 1992). In the last two decades, integrative reviews reached the conclusion that, overall, Holocaust survivor offspring (HSO) did not present quantitatively more signs of mental health problems than non-survivor offspring. The authors of these analyses do acknowledge, however, the existence of a group of offspring characterized by psychopathological symptoms (in)directly related to their parents' war experiences, their parents' war-related psychopathology, and/ or the impact of growing up in a Holocaust survivor family (Felsen, 1998; Kellermann, 2001; Solomon, 1998; Van IJzendoorn et al., 2003). In addition, a review by Leen-Feldner et al. (2013) among parents with PTSD (i.e., including but not restricted to Holocaust survivors) suggested that parental symptoms of PTSD are associated to various offspring mental health problems, including internalizing-type problems, general behavioral problems, and altered hypothalamic-pituitary-adrenal axis functioning. The important question then arises how parental war experiences contribute to the mental health problems of the HSO.

The aim of this systematic review was to increase our understanding of intergenerational consequences of (mass) violence by examining possible mechanisms that are associated with and may contribute to the development of mental health problems in World War II and specifically Holocaust survivor offspring. More specifically, five possible mechanisms will be evaluated that have been identified on the basis of theoretical and empirical studies as factors that may play a critical role in HSO mental health (Kellermann, 2001; Leen-Feldner et al., 2013; McGuire et al., 2015; Van IJzendoorn et al., 2003). The current review focused on: (a) parental mental health problems; (b) (perceived) parenting and attachment; (c) parental Holocaust history; (d) additional stress and traumatic life events in HSO; and (e) cortisol metabolism, epigenetic factors, and genetic predisposition.

Parental mental health problems

Severe mental illness may affect not only those suffering from it but also those who are in close personal contact with them (Lombardo & Motta, 2008). For example, parents with severe anxiety and/or depression may model patterns of thinking, feeling and behaving for their children (Katz et al.,2013; Rasic et al., 2014). Low self-esteem, distrust towards fellow human beings, and a pessimistic outlook on the world in general and on the future may be the dominant message conveyed to their offspring. We hypothesized therefore that a higher incidence of current and lifetime mental health problems and psychiatric diagnoses in Holocaust survivors are related to a higher incidence of mental health problems in HSO.

(Perceived) parenting and attachment

The attachment theory prescribes parenting that is responsive and attuned to the needs of the young child to grow up, thrive and explore the world (Bowlby, 1982; Winnicott, 1971). Parents who have to deal with unresolved problems from their past, for instance loss or maltreatment, may have difficulty in attuning to the needs of their offspring, impacting the quality of the interactions of parents with their children. Parents may, for example, exhibit frightened, frightening, or unexpected behaviour when they associate stressful situations in their current life with traumatic experiences in the past. These parenting practices or dynamics in the parent–child relationship may, in turn, underlie disorganized attachment and contribute to offspring's mental health problems (Hesse, 1999).

Furthermore, the caregiving style of Holocaust survivor parents has been characterized by a perceived inability to provide physical and emotional care and the perceived reversal of parent and child roles, as was stated by Wiseman et al. (2002) in their qualitative assessment of the characteristics of growing up in Holocaust survivor families (as perceived by offspring). Scharf and Mayseless (2011) indicated three major themes that characterized the parent–child relationship quality of HSO: *Survival issues*

(e.g., overprotection and fear of separation), *lack of emotional resources* (e.g., emotional neglect and unpredictable emotional reaction), and *coercion of the child to please the parents and satisfy their needs* (e.g., push to achieve and role reversal). Following this, we hypothesized that Holocaust experiences of the parents are associated with an unfavorable attachment style and related to unfavourable psychological development of HSO.

Parental Holocaust history

As a result of the mere absence of family members due to the Holocaust, the offspring may have had less family support available compared to non-Holocaust offspring. Moreover, survivor parent(s) possibly were less able to provide direct and indirect care, such as acting as an adequate role model or providing emotional support and advice (Chaitin, 2002; Krell et al., 2004; Wiseman et al., 2002). Children in one-survivor families (i.e., with the other parent alive and non-survivor) may be better off compared to children in two-survivor families, as the non-survivor parent can complement some of the tasks that are difficult for the survivor parent. We, therefore, hypothesized that growing up in a two-survivor family versus a one-survivor family is associated with more mental health problems in offspring.

Next, both parents will exert a different influence on the child's psychological development, for example in the processes of socialization; mothers still being dominant as a caregiver in particular when children are young (Kellermann, 2008; Wiseman et al., 2002). Besides the difference in parenting style between fathers and mothers it is becoming increasingly clear that severe stress in mothers during pregnancy can affect the development of the unborn child (Glover, 2015; Reynolds et al., 2015; Taouk & Schulkin, 2016). We thus expected a higher incidence of mental health problems in offspring of mother survivors compared to father survivors.

Additional stress and traumatic life events in HSO

Several authors have suggested a diathesis-stress model that predicts heightened vulnerability in HSO for stressful life events occurring later in life (Kellermann, 2001; Van IJzendoorn et al., 2003). In other words, HSO may show increased vulnerability to develop psychological disturbances when affected by serious physical or psychological stressors *additional* to the familial Holocaust experiences, like breast cancer (Baider et al., 2000) or combat experiences (Solomon et al., 1988). We thus hypothesized that HSO suffer from more mental health problems as a result of cumulating negative life events than non-survivor offspring.

Cortisol metabolism, epigenetic factors, genetic predisposition

Besides the impact of psychological mechanisms linking parental trauma and offspring mental distress, a growing number of studies have considered biological and (epi)

genetic mechanisms linking parental trauma with changes in offspring's cortisol metabolism compared to offspring of non-traumatized parents (e.g., Yehuda & Bierer, 2008b; Yehuda et al., 2005). It is becoming increasingly clear that parental stress, in a pre- or post-natal period, affects the stress system of offspring leading to epigenetic and cortisol level changes (Betancourt, 2015; Heim & Binder, 2012). The hypothalamic-pituitary-adrenal (HPA)-axis and the autonomic nervous system are central elements of the biological stress system. The HPA-axis functioning includes a cascade of neuroendocrine reactions with corticotrophin-releasing hormone (CRH) and adrenocorticotropic hormone (ACTH), which stimulates the secretion of the glucocorticoid cortisol and a feedback loop of cortisol binding with mineralocorticoid receptors (MR) and glucocorticoid receptors (GR). During stress, cortisol levels are high. The feedback loop prevents the stress-reaction from cortisol overshooting and promotes restoration after stress. When this stress system is activated for a longer period, however, or if there is no proper negative feedback inhibition of cortisol, basal hormone levels are not properly restored and this can lead to disturbances of the stress response and, in the long run, to the development of various types of disease. People in conditions of acute or chronic stress, and without PTSD, have heightened cortisol levels. In contrast, in individuals with PTSD, basal cortisol levels have decreased, and cortisol receptors appear to be more sensitive to cortisol.

In addition, (epigenetic) alterations have been associated with parental PTSD, major depression, and intergenerational effects on cortisol metabolism. FKBP5 is one of the genes that have impact on the stress response and specifically on glucocorticoid receptor sensitivity (GR-sensitivity) and responsiveness by altered methylation (Naumova et al., 2016). Increased FKBP5 methylation gives rise to decreased GR-sensitivity. Cortisol levels and responsivity thus appear to be an important index of the stress system and were therefore used as an indicator for heightened stress levels within the current review (Duthie & Reynolds, 2013; Klaassens, 2010). We hypothesized that HSO show increased basal cortisol levels, show less cortisol reactivity, and increased FKBP5 methylation.

METHODS

Search strategy, study selection, and data coding

We conducted a systematic literature search using the Preferred Reporting items for Systematic Reviews and Meta-Analyses (PRISMA) criteria (Liberati et al., 2009) to identify studies on offspring of World War Two survivors, published between 2000 and February 2018 with regard to the aforementioned factors. This timespan was chosen because studies up to 2000 were included in comprehensive former reviews (Kellermann, 2001; Van IJzendoorn et al., 2003). The search was performed using the following databases: PsycINFO, Pilots, Ovid Medline and Embase. The domains of the search and their synonyms were combined into syntaxes using Boolean operators. Only studies written in the English language were selected. The keywords have been chosen to closely align with the central concepts in our hypotheses. The list of key terms (including synonyms) was as follows: Second World War, Holocaust, concentration camp, survivor, child, adult offspring, second generation, mental or psychological disorders, symptoms, specific disorders (e.g., PTSD, depression, anxiety disorders, personality disorders), mental illness, symptoms, comorbidities, well-being, quality of life, identity, individuation, neurobiology, neuropsychology, genetic, epigenetic, cortisol metabolism. For the full syntax (PsycINFO) see appendix 1.

Figure 1 contains a flowchart of the study selection. World War Two survivor offspring was defined as being born after the war had ended and having had at least one parent that was exposed to World War Two cruelties. The studies were considered eligible for inclusion if they: (a) were written in the English language, (b) included World War Two survivors and offspring and (c) contained quantitative data. Excluded were (d) narrative or qualitative studies without quantitative data and (e) case reports, dissertations, book reviews, conference reports, theoretical papers and studies which had already been incorporated in earlier reviews (Kellermann, 2001; Van IJzendoorn et al., 2003).

In the initial search, 1372 studies were retrieved. After excluding duplicates, 392 studies remained, and 319 remained after screening of titles. Next, two researchers (PD & RK) independently reviewed the abstracts. After screening the abstracts, 34 articles remained and based on the full text, the final selection consisted of 23 articles. The reviewers agreed on 98% of the selected studies. After the debate, consensus was achieved on the remaining studies. With regard to data extraction, two authors (RH & TM) independently checked the accuracy of the first reviewer (PD) who extracted the data from the 23 included studies. Disagreements were resolved by discussion.

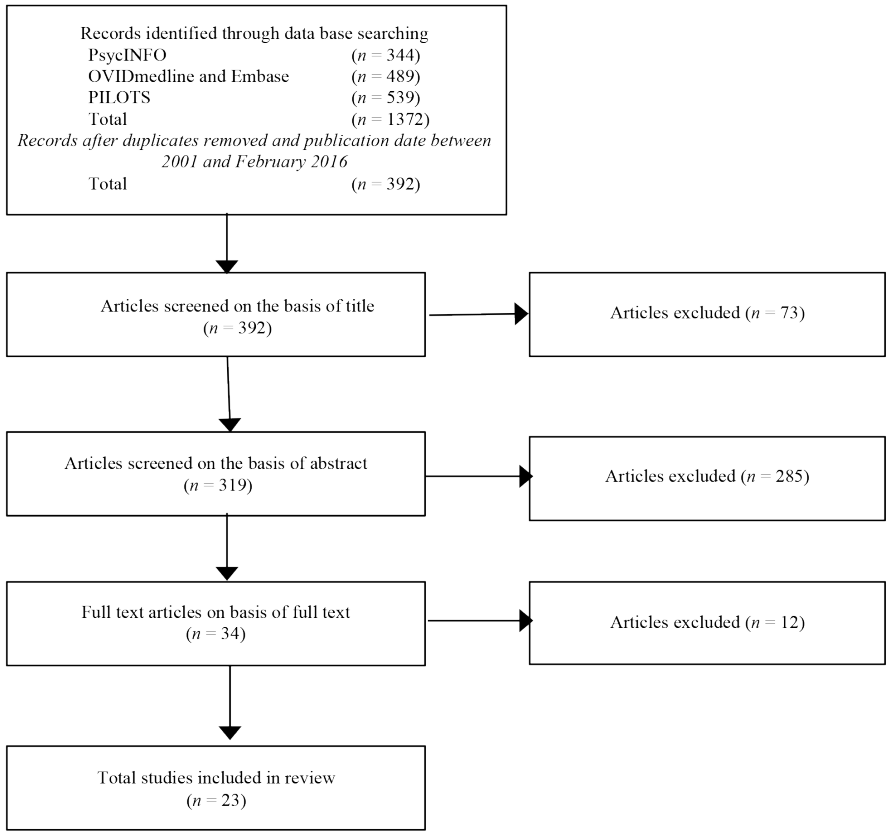

Figure 1. *Flowchart Study selection*

RESULTS

General study characteristics

The study characteristics of the selected studies are presented in Table 1. Several quality assessment tools were considered to evaluate the quality of the reviewed studies including the Cochrane Collaboration tool (Deeks et al., 2003; Downs & Black, 1998), the CASP Qualitative Checklist (2018) and the quality assessment criteria forwarded by the Joanna Briggs Institute (Moola et al., 2017). Unfortunately, most criteria were not applicable to the studies included in this review and not useful to evaluate their quality. Only a few general items of the instruments were suitable. Applying only part of the criteria of those standardized checklists has the disadvantage of having an incomplete assessment score which will be hard to interpret and compare to other studies. Therefore, we focused on the relevant methodological variables (i.e., recruitment and sample details, instruments used for diagnosis, measurement of outcomes, and statistical results) mentioned in Table 1. The final selection of studies all pertained to HSO; studies that focused on the intergenerational impact of any other World War Two survivors did not meet the inclusion criteria and therefore could not be included. Comparison groups in these studies mostly consisted of non-traumatized Jewish people (JCO). Most studies used convenient samples, recruited by advertisement or at conferences or meetings of Holocaust-related organizations. Sample sizes were: Holocaust survivors *N* between 32 and 178, a mean age range of 69 to 76 years; HSO *N* between 20 and 300, a mean age range of 38 to 57; JCO *N* between 9 and 149, a mean age range between 37 and 58. In some studies, the same, or partially overlapping, samples were used. Five studies included two generations (i.e., parents and offspring). Most studies included only offspring and data of the parents were obtained through reports of their children. Thirteen of the 23 studies included males and females, other studies consisted of only women. Participants in three studies were recruited through mental healthcare providers. Usually, participants with severe mental disorders, such as psychosis or bipolar disorder, alcohol or substance dependence or major medical illness were excluded. All studies entailed a cross-sectional design. Comparing mental health problems between HSO and JCO (see Table 1), it can be concluded that HSO reported more lifetime symptoms of anxiety disorders (including PTSD according to DSM-IV (Diagnostic and Statistical Manual of Mental Disorders, American Psychiatric Association [APA], 2000)) and depression, lower self-esteem, and difficulties in interpersonal functioning, they also showed difficulties in aggression regulation, a higher vulnerability to psychological distress, and they showed biological changes such as lower cortisol levels and epigenetic changes, with lower FKBP5 methylation compared to JCO.

The results of the reviewed studies are displayed in Tables 2–6. Effect sizes are reported in the corresponding tables whenever the necessary data were provided.

Table 1
Study characteristics

Authors, year	HS sample characteristics: Number; gender; age; residence during the war	JC Comparison sample characteristics: Number, gender, age, residence	HSO sample characteristics: Number; gender; age; residence during study	JCO Comparison sample characteristics: Number, gender, age, residence	Recruitment	HS response rate; HSO response rate	Offspring mental health complaints compared to JCO (outcome symptom measure)	Study focus
Bader, Bierer, Lehrner, Makotkine, Daskalakis, & Yehuda., 2014			Convenience sample *N* = 69 Holocaust survivor offspring	*N* = 26 Jewish non-HSO	Through advertisements and participation in earlier study		NS 24-hr urinary cortisol Trend for difference in depression, life-time PTSD diagnosis, and childhood trauma	Urinary cortisol
Baider, Goldzweig, Ever-Hadani, & Peretz, 2006			Group 1 HSO + former breast cancer *N* = 193; all women; *M age* = 48.7, *SD age* = 5.0; Israel Group 3 HSO healthy: *N* = 176; all women; *M age* = 46.2, *SD age* = 5.8; Israel	Group 2 former breast cancer non-traumatized parents: *N* = 164; all women; *M age* = 48.7, *SD age* = 6.8; Israel Group 4 healthy women non-traumatized parents: *N* = 143; all women; *M age* = 46.5, *SD age* = 8.1; Israel	Former first-time breast cancer patients (i.e., no evidence of active disease at the time of study) recruited from list of all patients diagnosed with stages 1 and 2 breasts cancer in between 1994 and 2000 in two oncology centers. All HSO patients (group 1) and a random sample of non-HSO (group 2) were invited to participate. Random sample of healthy HSO (group 3) selected from the files of National Holocaust Archive Random sample from Israel Interior Ministry Census files (group 4). No current or previous psychiatric conditions.	Group 1: 193/212 = 91% Group 2: 164/174 = 94% Group 3: 176/190 = 93% Group 4: 143/150 = 95%	Psychological distress (intrusion, avoidance IES) sign higher in HOS with cancer than in comparisons with cancer. Of coping variables, only helplessness was different between HSO and comparisons (MAC).	Lifetime stressors, cancer diagnosis

Table 1 *Continued.*

Authors, year	HS sample characteristics: Number; gender; age; residence during the war	JC Comparison sample characteristics: Number, gender, age, residence	HSO sample characteristics: Number; gender; age; residence during study	JCO Comparison sample characteristics: Number, gender, age, residence	Recruitment	HS response rate; HSO response rate	Offspring mental health complaints compared to JCO (outcome symptom measure)	Study focus
Baider, Goldzweig, Ever-Hadani, & Peretz, 2008	Mother-daughter dyads: Group 1 HS mothers *N* = 20; *M age* = 73.6, *SD age* = 6.6; Israel Group 3 HS mothers: *N* = 20; *M age* = 76.5, *SD age* = 7.6; Israel	Mother-daughter dyads: Group 2 Non-traumatized mothers: *N* = 20; *M age* = 74.3, *SD age* = 10.1; Israel Group 4 Non-traumatized mothers: *N* = 20; *M age* = 72.5, *SD age* = 8.6; Israel	Mother-daughter dyads: Group 1 HSO & former breast cancer *N* = 20; *M age* = 46.9, *SD age* = 7.1; Israel Group 3 HSO healthy: *N* = 20; *M age* = 45.4, *SD age* = 7.3; Israel	Mother-daughter dyads: Group 2 former breast cancer patients: *N* = 20; *M age* = 46.3, *SD age* = 9.8; Israel Group 4 healthy women: *N* = 20; *M age* = 45.8, *SD age* = 6.8; Israel	Random selection of 24 dyads out of each group included in Baider et al., 2006	Group 1: 20/24 = 83% Group 2:19/24 = 79% Group 3: 22/24 = 92% Group 4: 20/24 = 83%	Global Severity Index (BSI) differentiated between HSO with cancer and JCO with and HSO without cancer.	Lifetime stressors, cancer diagnosis
Bierer, Bader, Dasklalakis, Lehrner, Makotkine, Seckl, & Yehuda, 2014			*N* = 85 HSO, 40% male; *M age* = 46.9, *SD age* = 7.6; Israel	*N* = 27 JCO, 48.1% male; *M age* = 42.6, *SD age* = 10.5; Israel	Through advertisements; in part among participants of earlier study.		HSO more lifetime anxiety disorder (SCID, *d* = 0.40), and stage-anxiety (STAI; *d* = 0.44)). Reduced cortisol excretion in HSO compared to JCO; 11ß-HSD-2 activity elevated in HSO compared to JCO, in particular among mothers who had been children during WWII (24-hr urine sample).	Glucocorticoid metabolism, 11ß-HSD-2 activity

Table 1 *Continued.*

Authors, year	HS sample characteristics: Number; gender; age; residence during the war	JC Comparison sample characteristics: Number, gender, age, residence	HSO sample characteristics: Number; gender; age; residence during study	JCO Comparison sample characteristics: Number, gender, age, residence	Recruitment	HS response rate; HSO response rate	Offspring mental health complaints compared to JCO (outcome symptom measure)	Study focus
Gangi, Talamo, & Ferracuti, 2009			*N* = 40 Italian-Jew Holocaust survivor offspring, 33% had received psychotherapy. 50% Female, *M age* = 38, *SD age* = 12.4, Italy	Comparison group of *N* = 37 Italian Jew offspring who were able to hide during the war. 43.2% Female, *M age* = 37, *SD age* = 13.7; Italy	Recruited via Jewish register and after identification of those who had children.	Response rate 100%	HSO had higher anxiety levels, low self-esteem, inhibition of aggression, and relational ambivalence than JCO.	Intra-familial dynamics, e.g., organisation, expression of emotions.
Halligan & Yehuda, 2002			*N* = 87, 36% men, 64% women raised by parent(s) who survived the Nazi Holocaust	*N* = 39, 49% men, 51% women raised by parent(s) without Holocaust experience and free from current and lifetime axis I psychiatric disorders.	Participants were solicited from lists obtained from the Jewish community or responded to announcements and newspaper advertisements. In addition (*N* = 28) were enrolled through a specialized treatment program. *N* = 7 participants new since Yehuda et al., 2001.		Dissociative symptoms (DES) lower in JCO than sub-groups of HSO, being highest in HSO with current PTSD.	Mental health, PTSD in parents

Table 1 *Continued.*

Authors, year	HS sample characteristics: Number; gender; age; residence during the war	JC Comparison sample characteristics: Number, gender, age, residence	HSO sample characteristics: Number; gender; age; residence during study	JCO Comparison sample characteristics: Number, gender, age, residence	Recruitment	HS response rate; HSO response rate	Offspring mental health complaints compared to JCO (outcome symptom measure)	Study focus
Kellermann, 2008	HS characteristics provided by HSO: *N* = 273 mothers; born between 1905-1945; 65% born in Eastern Europe, 19% born in other occupied countries, 14% non-HS *N* = 273 fathers; born between 1895-1946; 70% born in Eastern Europe, 19% born in other occupied countries, 9% non-HS		*N* = 273 clinical offspring; 69% female; 48% born between 1945-1954, 37% born between 1955-1964, 15% born between 1965-1974; Israel	-	Consecutive admissions/ referrals to a HSO specialised clinic	Information not provided	No comparison group	Identification of demographic factors
Lehrner, Bierer, Passarelli, Pratchett, Flory, Bader, Makotkine & Yehuda, 2014			*N* = 80, 83% women, 74% men, *M* age = 56.6, *SD* = 8.5; USA	*N* = 15, 60% women, 40% men, *M* age = 58.7, *SD* = 11.2; USA	Through print and online advertisements in Jewish news outlets, second generation and other Jewish electronic mailing lists, advertisements and by word-of-mouth (2010-2012).		HSO more likely than JCO to have a current anxiety disorder diagnosis (SCID; *d* = 0.45) and to report symptoms of depression (BDI; *d*=0.78) and anxiety (STAI; *d* = 0.79), as well as to report more child abuse and neglect (*d* = 0.70; CTQ). HSO had higher 24-hr urinary cortisol levels (LST).	Glucocorticoid sensitivity

Table 1 *Continued.*

Authors, year	HS sample characteristics: Number; gender; age; residence during the war	JC Comparison sample characteristics: Number, gender, age, residence	HSO sample characteristics: Number; gender; age; residence during study	JCO Comparison sample characteristics: Number, gender, age, residence	Recruitment	HS response rate; HSO response rate	Offspring mental health complaints compared to JCO (outcome symptom measure)	Study focus
Letzter-Pouw, Shrira, Ben-Ezra, & Palgi, 2014			Sample one *n* = 172[a] 48.3% women; *M age* 42.8, *SD age* = 7.3; Israel Sample two *n* = 161; 58.4% women; *M* age 55.4, *SD age* = 5.3; Israelis from families of European origin. At least one parent who was under Nazi or pro-Nazi occupation or domination in Europe during the Second World War.	Sample two *N* = 124 parents without holocaust background; 54.4% women; *M* age 54.4, *SD age* = 5.7	Sample one nationally representative sample recruited by contacting everyone on a list (*n* = 272) provided by Ministry of Interior of persons living throughout Israel, born between 1928 and 1945 in a European country that suffered Nazi occupation and who immigrated to Israel after 1945. Sample two convenience sample community-dwelling, recruited across the country.	Sample one HSO 63% Sample two HSO 60%	Sample one was not compared Sample two HSO reported higher Holocaust salience (*n2p* = .36); transmission of burden (PPRBQ) from mother (*n2p* = .11) and father (*n2p* = .09).	Perceived parental burden.
Letzter-Pouw & Werner, 2013	*N* = 178[a] dyads; (almost equally divided between both genders; *M age* 69.8, *SD age* = 5.1); 87% born in Eastern Europe, 13% born in Western Europe		*N* = 178[a], first-born; almost equally divided between both genders; *M age* = 43.8, *SD age* = 7.3); Israel	-	Sample recruited by contacting everyone on a representative list (*N* = 272) provided by national Ministry of Interior of persons living throughout Israel, born between 1928 and 1945 in a European country that suffered Nazi occupation and who immigrated to Israel after 1945.	HS 178 / 272 = 65%; HSO 178 / 272 = 65%	No comparison group	Intrusive memories in Holocaust child survivors and well-being of HSO.

Table 1 *Continued.*

Authors, year	HS sample characteristics: Number; gender; age; residence during the war	JC Comparison sample characteristics: Number, gender, age, residence	HSO sample characteristics: Number; gender; age; residence during study	JCO Comparison sample characteristics: Number, gender, age, residence	Recruitment	HS response rate; HSO response rate	Offspring mental health complaints compared to JCO (outcome symptom measure)	Study focus
Sagi-Schwartz, Van IJzendoorn, Grossmann, Joels, Grossmann, Scharf, Koren-Karie, & Alkalay, 2003	HS who immigrated as orphans from Europe to Israel during or after the war, HSO (*N* = 48). Born in Europe between 1926 and 1937.	Comparison group of subjects in same age range, also born in Europe but immigrated to Israel before the war.	*N* = 50 Mother offspring HSO, females, born between 1947 and 1970.	JCO, females, born between 1947 and 1970.	Population register provided by Israeli government. Thereupon 30.000 standardized telephone calls.		HS showed more traumatic stress and less lack of resolution of trauma than JC (*d* = .77) HS fewer secure attachment representations than JC; HSO not different in attachment classification from JCO.	Attachment impacted by Holocaust trauma
Shrira, 2015			*Study 1 N* = 63; *M age* = 57.1, *SD* = 6.26, 61.9% women Study 2 *N* = 300 respondents with at least one Holocaust survivor parent. *M age* = 57.8, SD = 4.6, 59% women.	*N1* = 43, *M age* = 54.7, *SD* = 8.56, 55.8% women *N2* = 150, *M* age = 57.12, *SD* = 4.64, 56.8% women.	Study 1 Convenience sample of community-dwelling, Hebrew speaking Jewish Israelis from families of European origin living in Tel Aviv and its surroundings. Data collection in June 2012. Study 2 had similar procedures as in Study 1. Data collection 2012-2013.		HSO reported higher Iranian nuclear threat salience (8-items) than JCO. HSO also reported more anxiety symptoms (Study 1, TMAS-SF); and psychological distress (Study 2, BSI-18).	Coping with threat: Iranian nuclear threat salience

Table 1 *Continued.*

Authors, year	HS sample characteristics: Number; gender; age; residence during the war	JC Comparison sample characteristics: Number, gender, age, residence	HSO sample characteristics: Number; gender; age; residence during study	JCO Comparison sample characteristics: Number, gender, age, residence	Recruitment	HS response rate; HSO response rate	Offspring mental health complaints compared to JCO (outcome symptom measure)	Study focus
Shrira, Palgi, Ben-Ezra & Shmotkin, 2011			*N* = 215 born in 1945 or later, in Israel, Europe/United States or in the Former Soviet Union, with a father born in Europe/ United States (except for 20 respondents who were born in Europe/ United States but had a father from a non-European origin),	*N* = 149; neither parent had lived under Nazi or pro-Nazi occupation/ domination	Probability sample drawn from the Israeli component of the Survey of Health, Ageing and Retirement in Europe. Interviewed in 2005-2006. Also, drop-off questionnaire.	66.6% of total sample completed the questionnaire	Differences between HSO and JCO in number of major health problems, of physical symptoms and number of medications. HSO also reported higher optimism and hope, and better life satisfaction.	Function of number of survivor parents.

Table 1 *Continued.*

Authors, year	HS sample characteristics: Number; gender; age; residence during the war	JC Comparison sample characteristics: Number, gender, age, residence	HSO sample characteristics: Number; gender; age; residence during study	JCO Comparison sample characteristics: Number, gender, age, residence	Recruitment	HS response rate; HSO response rate	Offspring mental health complaints compared to JCO (outcome symptom measure)	Study focus
Yehuda, Bell, Bierer & Schmeidler, 2008a			*N* = 211; 117 men, 167 women (*M* age = 43.2; *SD* age = 9.1; born 1938 - 1979) with at least one parent interned in a Nazi-concentration camp during WW II or had faced comparably severe threats in hiding.	*N* = 73 comparable age, with parents who were not exposed to the Holocaust or war-events.	Community sample recruited through advertisements. *N* =145 new observations since Yehuda et al., 2001.		A higher prevalence of lifetime PTSD, mood, anxiety disorders, and to a lesser extent, substance abuse disorders, was observed in HSO than in JCO (SCID, CAPS).	Maternal vs paternal PTSD and PTSD occurrence in HSO.
Yehuda & Bierer, 2008b			*N* = 41 HSO *N* = 18 HSO with maternal PTSD; *M age* = 49.8, *SD age* = 6.5; *N* = 6 men, *N* = 12 women *N* = 23 HSO without maternal PTSD (*M age* = 50.4, *SD age* = 7.3 *N* = 7 men, *N* = 16 women	*N* = 19 JCO (*M age* = 44.4, *SD age* = 9.5; *N* = 12 men, *N* = 7 women			Trauma exposure (Mississippi PTSD Scale; CTQ; PBI) Depression symptoms (BDI)	Urinary and salivary cortisol levels PTSD risk

Table 1 *Continued.*

Authors, year	HS sample characteristics: Number; gender; age; residence during the war	JC Comparison sample characteristics: Number, gender, age, residence	HSO sample characteristics: Number; gender; age; residence during study	JCO Comparison sample characteristics: Number, gender, age, residence	Recruitment	HS response rate; HSO response rate	Offspring mental health complaints compared to JCO (outcome symptom measure)	Study focus
Yehuda, Blair, Labinsky, Bierer, 2007a			*N* = 25 HSO *n* = 23 HSO with PTSD *n* = 10 HSO without PTSD, USA	*N* = 16 JCO, USA	Recruitment through advertisements.		Cortisol levels were lowest in HSO with parental PTSD (plasma levels), higher in HSO without parental PTSD and highest in JCO.	Plasma cortisol levels.
Yehuda, Daskalakis, Bierer, Bader, Klengel, Holsboer, & Binder, 2016	*N* = 32, including both parents for 5 HSO; 37.5% male, 62.5% female, *M* age = 77.9, *SD* = 5.2.	*N* = 8, 25.0% male, 75.0% female, *M* age = 73.1, *SD* = 8.5.	*N* = 22, including multiple siblings in *N* = 2. 27.3% male, 72.7% female, *M* age = 46.0, *SD* = 8.0, USA	*N* = 9. 11.1% male, 88.9% female, *M* age = 47.0, *SD* = 8.5, USA	Dataset part of a larger sample of HSO, of which the majority was recruited 1993-1995 and longitudinally followed-up 10 years after.		Holocaust exposure had an effect on FKBP5 methylation observed in exposed parents as well as their offspring. Methylation was lower in HSO compared to controls.	Cytosine methylation within the gene encoding for FK506-binding-protein-5 (FKBP5)
Yehuda, R., Daskalakis, Lehrner, Desarnaud, Bader, Makotikine, Flory, Bierer & Meaney, 2014			*N* = 80 HSO 75% had both parents exposed *n* = 53 (55.8%) maternal PTSD *n* = 42 (44.2%) paternal PTSD *n* = 15 no parental PTSD, USA	*N* = *15* JCO no parental PTSD, USA	95/120 = 79% response rate		Alterations of specific methylation were demonstrated in relation to parental PTSD and neuroendocrine outcomes. Interaction effect of paternal and maternal PTSD was found.	Influence of maternal and paternal PTSD on DNA methylation and its relationship to glucocorticoid receptor sensitivity

Table 1 *Continued.*

Authors, year	HS sample characteristics: Number; gender; age; residence during the war	JC Comparison sample characteristics: Number, gender, age, residence	HSO sample characteristics: Number; gender; age; residence during study	JCO Comparison sample characteristics: Number, gender, age, residence	Recruitment	HS response rate; HSO response rate	Offspring mental health complaints compared to JCO (outcome symptom measure)	Study focus
Yehuda, Halligan & Bierer, 2001a			*N* = 95 (33.3% men, 66.7% women) having been born to at least one biological parent who experienced the Nazi Holocaust.	*N* = 40 (57% men, 43% women) Jewish individuals in the same age range who did not have a parent who was a Holocaust survivor, not necessarily without psychiatric diagnoses.	Recruitment from lists obtained from the Jewish community or through community group announcements (*N* =109); or through a specialized treatment program (*N* = 26). *N* = 42 (26 HSO; 16 JCO) subjects were new participants compared to prior publications.		HSO differed from JCO in mean number of lifetime diagnoses, in particular PTSD, depressive and (trend:) anxiety disorders (SCID, CAPS).	Development of PTSD, depressive and anxiety disorders in HSO as a function of parental exposure and PTSD.
Yehuda, Halligan, & Bierer 2002			*N* = 39 (18% men, 82% women) having been born to at least one biological parent who experienced the Nazi Holocaust; USA.	*N* = 15 (53.3% men, 46.7% women) Jewish individuals in the same age range who did not have a parent who was a Holocaust survivor, free from psychiatric diagnoses; USA.	Described in Yehuda et al., (2000)		HSO and JCO did not differ in urinary cortisol concentration. The occurrence of (lifetime and current) psychiatric disorder was higher in HSO than in JCO.	Cortisol levels related to severity of PTSD symptoms Number of parents affected

Table 1 *Continued.*

Authors, year	HS sample characteristics: Number; gender; age; residence during the war	JC Comparison sample characteristics: Number, gender, age, residence	HSO sample characteristics: Number; gender; age; residence during study	JCO Comparison sample characteristics: Number, gender, age, residence	Recruitment	HS response rate; HSO response rate	Offspring mental health complaints compared to JCO (outcome symptom measure)	Study focus
Yehuda, Halligan & Grossman, 2001b			*N* = 51, 20 men, 31 women having been born to at least one biological parent who experienced the Nazi Holocaust. *M* age = 40.9, *SD* = 7.6; USA.	*N* = 41, 23 men, 18 women, with the same age range (24-60 years) who did not have a parent who was a Holocaust survivor. *M* age = 38.3, *SD* = 8.8; USA.	Participants were solicited from lists obtained from the Jewish community, through advertisements (*n* = 79), and via short-term group psychotherapy (*n* =13).		HSO reported more emotional abuse, neglect, physical neglect and (trend:) sexual abuse than JCO (CTQ).	The impact of childhood trauma; influenced by parental trauma exposure and parental PTSD.

Table 1 *Continued.*

Authors, year	HS sample characteristics: Number; gender; age; residence during the war	JC Comparison sample characteristics: Number, gender, age, residence	HSO sample characteristics: Number; gender; age; residence during study	JCO Comparison sample characteristics: Number, gender, age, residence	Recruitment	HS response rate; HSO response rate	Offspring mental health complaints compared to JCO (outcome symptom measure)	Study focus
Yehuda, Teicher, Seckl, Grossman, Morris & Bierer, 2007b			*N= 33 HSO* *N* = 23 HSO with parental PTSD *N* = 10 HSO no parental PTSD	*N= 16 JCO*			Offspring with paternal PTSD only were not significantly different in mean cortisol level than offspring with no parental PTSD or comparison subjects (JCO). Mean cortisol levels were similar for offspring with PTSD in both parents and those with maternal PTSD only, whereas both groups differed from offspring with no parental PTSD (p = .02 and p = .045, respectively) and from comparison subjects (p = .009 and p = .02, respectively).	Cortisol levels related to parental PTSD

Table 1 *Continued.*

Authors, year	HS sample characteristics: Number; gender; age; residence during the war	JC Comparison sample characteristics: Number, gender, age, residence	HSO sample characteristics: Number; gender; age; residence during study	JCO Comparison sample characteristics: Number, gender, age, residence	Recruitment	HS response rate; HSO response rate	Offspring mental health complaints compared to JCO (outcome symptom measure)	Study focus
Van IJzendoorn, Fridman, Bakermans-Kranenburg, & Sagi-Schwartz, 2013	Mother-daughter dyads: HS parents: *N* = 32; 100% female, *M age* = 76.98, *SD* = 2.99, Israel	JC parents: *N* = 33; 100% female; *M age* = 76.98, *SD* = 2.99.	Mother-daughter dyads: *N* = 47 HSO, *M age* = 47.46, *SD* = 4.41, daughters in Israel	Mother-daughter dyads: *N* = 32 JCO *M age* = 47.46, *SD* = 4.41, daughters in Israel	Recruitment through register of Israeli Ministry.	82.3% first generation; 82.3% second generation	HSO showed lower cortisol levels only when surviving parents displayed more dissociation (whereas HS showed higher levels of daily cortisol versus comparisons).	Dissociation as moderating factor in the biological stress regulation system in HSO.

Note. [a] = sample overlap, in the 2014 report, 6 participants were excluded as not eligible for the research purposes; HS = Holocaust Survivors; HSO = Holocaust Survivor offspring; JCO = Jewish comparisons offspring; Only outcome symptom measures relevant for the current review were included: BDI = Beck Depression Inventory (Beck et al., 1961); BSI = Brief Symptom Inventory (Derogatis & Melisaratos, 1983); CTQ = Childhood Trauma (Bernstein et al., 1997); CAPS = Clinician Administered PTSD Scale (Blake et al., 1990); DES = Dissociative Experiences Scale (Bernstein & Putnam, 1986); IES = Impact of Event Scale (Horowitz, Wilner, & Alvarez, 1979); MAC = Mental Adjustment to Cancer (Watson et al., 1988); NHSPQ/PPRBQ = New Holocaust Survivor Parenting Questionnaire/Perceived Parental Rearing behavior Questionnaire (Kellermann, 2001); SCID = Structured Clinical Interview for DSM-IV (Spitzer et al., 1995); STAI = Spielberger State Trait Anxiety Inventory (Spielberger 1968); TMAS-SF = Taylor Manifest Anxiety Scale-Short Form, ((Bendig, 1956)

Association between parental and offspring's mental health problems

The association between mental health problems of the Holocaust survivors and of their offspring born after the war has been the subject of five studies (see Table 2). Letzter-Pouw and Werner (2013) first of all found no direct association between survivor and offspring symptoms of psychological and physical distress in a sample of 178 Holocaust survivors and their first-born offspring. However, they did find a significant indirect relation, with survivor and offspring distress mediated by the perceived mother's transmission of trauma by the offspring. Also, in another study, posttraumatic symptoms in offspring were significantly predicted by perceived 'transmission' of parental burden (medium effect size), determined by items such as 'My parent transmitted his or her burden of the Holocaust onto me' (Letzter-Pouw et al., 2014).

Other studies did find a direct association between Holocaust survivors and HSO's mental symptoms or diagnoses, in particular posttraumatic stress disorder (PTSD). In their study of 2001, first of all, Yehuda, Halligan, and Bierer (2001a) pointed to parental PTSD as a significant predictor of the occurrence of PTSD in HSO (large effect size). In a later study Yehuda, Bell, Bierer, and Schmeidler (2008a) found an association between maternal (or both parents with) PTSD and PTSD, mood disorder or any psychiatric disorders among offspring (large effect size) Next, Halligan and Yehuda (2002) investigated whether dissociative symptoms were related to the impact of parental PTSD on the mental health condition of their offspring. Parental PTSD was reported more often by HSO with PTSD than without PTSD. Their findings demonstrated that dissociative symptoms HSO were significantly elevated in HSO with current PTSD and parental PTSD (medium effect size), whereas this elevation was absent in offspring with past PTSD, only parental PTSD or only parental Holocaust exposure (Halligan & Yehuda, 2002).

We expected a significant association between psychiatric symptoms in survivors and offspring. In line with this, evidence was found for associations between parental PTSD after Holocaust experiences and current psychiatric symptoms (including PTSD and anxiety/mood symptoms) in offspring. The correlation between parental PTSD and depression or PTSD among HSO appeared to be different among offspring samples with paternal, maternal or both parents with PTSD. A significant relation with large effect sizes has been found between maternal PTSD and PTSD in offspring, while PTSD in both parents may be related to either PTSD or depressive symptoms in the next generation (Yehuda et al., 2008a).

Table 2
Mental health complaints in parents and their children

Author	Results (assessment instruments) pertaining to parent psychopathology and functioning	Results (assessment instruments) pertaining to offspring psychopathology and functioning	Results (assessment instruments) pertaining to the association between parent and offspring psychopathology and functioning
Halligan et al., 2002	24 HSO (27.5%) had one or both parents with PTSD (PPQ).	Dissociative symptoms (DES) were elevated in individuals with current PTSD (CAPS), but not in those with past PTSD or with parental PTSD and considered at risk for PTSD (PPQ). Dissociative symptoms were associated with forms of psychopathology (e.g., the number of diagnoses) other than PTSD.	In HSO, parental PTSD was thought to be a risk factor for dissociative symptoms. However, dissociative symptoms (DES) were not elevated in individuals with parental PTSD (PPQ). Of the *n* = 27 (31%) offspring with current or past PTSD, 24 (89%) indicated that their parent(s) had had PTSD. Of the *n* = 60 offspring without current or past PTSD, *n* = 33 (55%) indicated that their parent(s) had had PTSD.
Kellermann, 2008	Perceived mental health father: Difficult 17% Middle 40% Good 28% Missing value 15% Perceived mental health mother: Difficult 24% Middle 37% Good 22% Missing value 17% Perceived functioning father: Fully 66% Partly 20% Impaired 1% Missing value 13% Perceived functioning mother: Fully 64% Partly 19% Impaired 3% Missing value 14%		,
Letzter-Pouw et al., 2014		PTSD symptoms *M* = 1.73, *SD* = 1.78 (CAPS)	After controlling for age, gender, education, and life events, perceived "transmission" of burden from mother (NHSPQ/ PPRBQ) (as well as number of survivor parents) predicted HSO posttraumatic symptoms (CAPS). In a separate analysis, and after controlling for age, gender, education, and life events, perceived "transmission" of burden from father (NHSPQ/ PPRBQ) predicted HSO posttraumatic symptoms (CAPS).

Table 2 *Continued.*

Author	Results (assessment instruments) pertaining to parent psychopathology and functioning	Results (assessment instruments) pertaining to offspring psychopathology and functioning	Results (assessment instruments) pertaining to the association between parent and offspring psychopathology and functioning
Lehrner et al., 2014	Of the N = 80 parents with Holocaust exposure (11.6% father, 9.5% mother, 63.2% both parents), 32.6% both parents had PTSD, 23.2% maternal PTSD, and 11.6% paternal PTSD (PPQ).	5.4% HSO had Major Depressive Disorder, 41.1% anxiety disorder (MINI)	Maternal PTSD was associated with increased glucocorticoid sensitivity in offspring (demonstrated by LST and DST, and lower urinary cortisol excretion). When fathers had PTSD, only in the context of maternal PTSD, did offspring show increased glucocorticoid sensitivity and diminished urinary cortisol. Both maternal and paternal PTSD were positively associated with emotional abuse (*r* = .30; *r* = .32 respectively). Paternal, rather than maternal PTSD was associated with family conflict (*r* = .36). When parents were diagnosed with PTSD, emotional abuse (CTQ) and family conflict (FES) moderated the effects of PTSD on glucocorticoid sensitivity in offspring.
Yehuda et al., 2001a	*N* = 93 HSO, of whom *N* = 60 (64.5%) parental PTSD; *N* = 33 (35.4%) HSO non-parental PTSD (PPQ); *N* = 42 JCO.	56% HSO had depressive disorder while 29% HSO had PTSD.	Parental PTSD coincides with occurrence of PTSD in offspring. *M* = 2.5 lifetime psychiatric diagnoses in HSO with parental PTSD; *M* = 1.8 diagnoses in HSO without parental PTSD.
Yehuda et al., 2001b	*N* = 32 (62.7%) HSO had one or both parents with PTSD; *n* = 19 (37.3%) HSO without parental PTSD. Of *N* = 32, 15 had one parent with PTSD, 17 two parents with PTSD.	*N* = 17; 33.3% PTSD	Parental PTSD was associated with a higher incidence of emotional abuse (66% with parental PTSD vs. 37% without parental PTSD), and physical neglect (56% vs 21%). CTQ scores were associated with PTSD in HSO for emotional abuse *r* = .24; emotional neglect *r* = .34; physical neglect *r* = .36 and sexual abuse *r* = .27.
Yehuda et al., 2007a	*N* = 13 HS with PTSD; *N* = 12 HS without PTSD; *N* = 16 JC	*N* = 4 (66.7%) HSO met criteria for lifetime PTSD (none for current PTSD)	

Table 2 *Continued.*

Author	Results (assessment instruments) pertaining to parent psychopathology and functioning	Results (assessment instruments) pertaining to offspring psychopathology and functioning	Results (assessment instruments) pertaining to the association between parent and offspring psychopathology and functioning
Yehuda et al., 2008	*N* = 49 (30.4%) HSO with paternal PTSD; *N* = 40 (24.8%) HSO with maternal PTSD; *N* = 35 (21.7%) both parents with PTSD; *N* =37 (23%) no parental PTSD (PPQ).	69.5% HSO had any lifetime psychiatric diagnosis. More specifically, prevalence in HSO (*N* = 200): PTSD 19.0%; mood disorder 45.5%; anxiety disorder (32.5%); eating disorder 6.0%; substance abuse 10.5%, and adjustment disorder 10.0% (SCID DSM IV; CAPS).	Based on the prevalence rates reported for occurrence of PTSD, mood disorder or any psychiatric disorder in HSO, having a mother or both parents with PTSD increased the likelihood of having PTSD (OR paternal PTSD 1.24, maternal PTSD 3.45, both parents PTSD 4.18) compared to having no parental PTSD. Differences among percentages of mood disorder are less large between parental PTSD versus non-parental PTSD (OR parental PTSD 1.75, maternal PTSD 1.68, both parents PTSD 2.07). Among females, paternal PTSD was related to PTSD development; among males, if the father had PTSD they were less likely to develop PTSD (X^2 = 3.94, df = 1, p = 0.47).
Yehuda et al., 2016	*N* = 16 (51.6%) PTSD *N* = 4 (13.8%) anxiety disorder (other than PTSD) *N* = 9 (31.0%) Mood disorder (SCID, CAPS) As was retrospectively evaluated by HSO (PPQ): Maternal PTSD; *N* = 11 (52.4%) Paternal PTSD; *N* = 11 (52.4%) Any parent with PTSD; *N* = 16 (76.2%) (PPQ)	*N* = 8 (36.4%) anxiety disorder (other than PTSD) *N* = 3 (13.6%) Mood disorder (SCID)	Epigenetic changes were demonstrated (by changes in methylation levels) in two generations (HS and HSO) that were correlated.

Note. HS = Holocaust survivors; HSO = Holocaust survivor offspring; JCO = offspring of Jewish comparisons; BDI = Beck Depression Inventory (Beck, 1995); CAPS = Clinical Administered PTSD Scale (Blake et al., 1995); PDS = Posttraumatic Diagnostic scale (Foa et al., 1997); HSS = Holocaust Salience Scale, questionnaire composed of items from the Holocaust Exposure Scale (Zohar et al., 2007) and Holocaust Related Imagery questionnaire (Sorscher et al., 1997); MCQ-30 = Metacognitions Questionnaire (Wells & Cartwright, 2004); NHSPQ New Holocaust Survivor Questionnaire (Kellermann, 2001); PPQ = Parental PTSD Scale (Yehuda et al., 2000; 2008); PPRBQ = Perceived Parental Rearing Behavior Questionnaire (Kellermann, 2001); SCID = Structured Clinical Interview for DSM-IV (Spitzer et al., 1995).

Perceived parenting and attachment

The perceived quality of the parent–child relationship, the (perceived) quality of parenting and the family climate, and/or attachment characteristics were assessed in 10 studies (see Table 3). Letzter-Pouw and Werner (2013) reported in particular the impact of mother's 'transmission' of Holocaust: offspring experienced their mothers as significantly more affectionate (small effect size) and demonstrating more over-involvement than fathers (large effect size), and this style of mothering significantly

predicted posttraumatic symptoms at HSO (large effect size) (Letzter-Pouw et al., 2014). As noted above, this perceived 'transmission' of trauma by mother mediated the relation between survivor and offspring distress (Letzter-Pouw & Werner, 2013). Parental PTSD was significantly associated with higher reported occurrence of child maltreatment in HSO, more specifically emotional abuse and neglect, physical neglect and sexual abuse (medium to large effect sizes) (Yehuda, Blair, Labinsky, & Bierer, 2007a; Yehuda, Halligan, & Grossman, 2001b). Mental health symptoms were highly correlated (large effect size) with emotional abuse, physical neglect and high CTQ scores (Yehuda et al., 2007a).

In order to examine the social climate in families, the Family Environment Scale (FES) was used in two studies (Gangi et al., 2009; Lehrner et al., 2014). Results indicated that offspring of Holocaust survivors could be distinguished significantly (medium effect sizes) from Jewish comparisons by a number of characteristics: They perceived their family as expressing emotions more poorly than offspring of comparison families. Next, HSO parents were likely to attribute greater importance to organizing and planning of family activities and responsibilities, and to put greater emphasis on following family rules. Family goals were considered strongly oriented towards competition and accepting challenges. Moreover, offspring reported to be less assertive and less able to make their own decisions. Holocaust offspring in this study did not differ significantly from comparisons on their reports of family cohesion, family conflict, achievement orientation, intellectual-cultural orientation, active-recreational orientation, and moral-religious emphasis (Gangi et al., 2009).

Lehrner et al. (2014) studied the moderating effects of parenting style and family functioning on the relation between survivor PTSD and offspring mental health symptoms. They found that both maternal and paternal PTSD were significantly related to emotional abuse in the family rearing style, and family conflict was significantly associated with paternal, rather than maternal PTSD (all medium effect sizes). In HSO with maternal PTSD, perceived maternal care was significantly lower while maternal overprotection was experienced as higher. No significant association with paternal PTSD was found (Yehuda & Bierer, 2008b).

The Adult Attachment Interview (AAI; Hesse, 1999) was used to assess the attachment style between parents (caregivers) and children and adult mental representations of childhood attachment experiences, including loss and trauma experiences (Sagi-Schwartz et al., 2003). It was demonstrated that a non-clinical sample of Holocaust survivor mothers showed significantly more insecure attachment than a comparison group of non-survivor mothers. More specifically, survivor mothers scored high on unresolved attachment (i.e., either a disoriented attachment style because of lack of resolution of loss and trauma or a mixture of diverging insecure attachment styles). In contrast, Holocaust offspring showed no evidence of higher insecure attachment classification compared to the comparison group.

Finally, the data were consistent with the hypothesis that Holocaust survivor parents were not always able to be responsive and attuned to the child because of their traumatic experiences and mental symptoms. Overall, the reviewed studies demonstrated with medium to large effect sizes, a significant association between (perceived) parental PTSD symptoms and childhood trauma experiences of HSO. In particular a significant association with experiences of emotional abuse, neglect, and physical neglect (e.g., Yehuda et al., 2007a, 2001b), was found in parents, who were diagnosed with PTSD, emotional abuse and family conflict moderated the relationship between PTSD and offspring's glucocorticoid sensitivity (Lehrner et al., 2014). Yehuda et al. (2016) reported significantly higher prediction of epigenetic consequences from parental trauma than offspring's own childhood trauma (medium effect size).

Table 3
Perceived parenting, attachment and mental health complaints in HSO

Author	HSO results on attachment / perceived parenting (instruments)	Results pertaining to association between parent and offspring attachment and offspring mental health
Gangi et al., 2009	HSO differed from JCO in terms of perceiving their family as expressing emotions poorly (*d*= .56); not being assertive and make their own decisions (*d*= .57); attribute greater importance on organizing and planning of family activities and responsibilities (*d*= .51) and put greater emphasis on following family rules (*d*= .43). They described their ideal family as being strongly oriented toward competition and accepting challenges (*d*= .64) (FES). HSO did not differ from JCO on scales of family cohesion, family conflict, achievement orientation, intellectual-cultural orientation, active-recreational orientation, and moral-religious basis.	
Lehrner, et al., 2014	Emotional abuse (CTQ) was positively associated with both maternal and paternal PTSD (*r* = .30; *r* = .32).	Of family environment factors (cohesion, expressiveness, conflict, organization, and control; FES) only conflict was correlated to glucocorticoid sensitivity (LST) in HSO. When family conflict was included as a covariate including maternal and paternal PTSD and Holocaust exposure, the main effect of maternal PTSD was unchanged. Family conflict moreover, was correlated with paternal, but not maternal PTSD (*r* =.36). Emotional abuse and family conflict moderated the effects of parental PTSD on stress sensitivity in offspring.
Letzter-Pouw, et al., 2013	Perceived parenting: HSO reported more affection (*d* = .28), over-involvement (*d* = .54), and transmission (*d* = .31) of the Holocaust from mothers than fathers, no differences between mothers and fathers on punishing (NHSPQ).	The relation between HS psychological and physical distress (BSI) and HSO distress (BSI) was mediated by perceived parenting, more specifically perceived mother's "transmission" of trauma (NHSPQ/PPRBQ).

Table 3 *Continued.*

Author	HSO results on attachment / perceived parenting (instruments)	Results pertaining to association between parent and offspring attachment and offspring mental health
Letzter-Pouw, et al., 2014	Sample one Mothers were perceived to transmit more burden to their offspring than fathers (NHSPQ) (*d* = .33). Sample two HSO perceived more transmission of burden from mother (*d* = .70) and father (*d* = .64) versus comparisons (NHSPQ).	Both perceived transmission from mother and father (NHSPQ) were positively related with posttraumatic symptoms (CAPS). After controlling for age, gender, education, and life events, perceived "transmission" of burden from mother (NHSPQ/ PPRBQ) (as well as number of survivor parents) predicted HSO posttraumatic symptoms (CAPS). In a separate analysis, and after controlling for age, gender, education, and life events, perceived "transmission" of burden from father (NHSPQ/ PPRBQ) predicted HSO posttraumatic symptoms (CAPS).
Sagi-Schwartz et al, 2003	No differences in proportion HSO (54%) and JCO (42%) with insecure attachment (AAI). No differences in proportion HSO (17%) and JCO (8%) with unresolved loss (AAI) No difference between HSO and JCO on mother-infant interactions (disorganizing maternal behaviours; MIDBS). No differences between HSO and JCO in satisfaction with relationship with mothers (CS).	Interaction between attachment type (secure vs insecure) x generation (first, second) indicated less insecure attachment in the second generation, both for the Holocaust and comparison group. In 60% of the cases, survivors and offspring show the same (secure or insecure) attachment representation. Insecure attachment in 46% of HS and HSO dyads vs. 28% in the comparison sample. No evidence of intergenerational transmission of unresolved attachment.
Yehuda, et al., 2001b	Adult Holocaust survivor offspring reported significant more childhood trauma, particularly emotional abuse (*d* = 1.02), emotional neglect (*d* = .96) and physical neglect (*d* = .94), compared to non-Holocaust survivor offspring.	HSO was found to be at higher risk for PTSD relative to comparison subjects; this was related to the experience of childhood trauma in HSO (particularly emotional abuse and (physical and emotional) neglect).
Yehuda et al., 2008	Based on the PBI HSO with maternal PTSD differed from HSO without maternal PTSD in the perceived maternal care, maternal overprotection and not as much in the paternal care and overprotection.	
Yehuda et al., 2007a	Parental PTSD symptoms were significantly correlated with childhood emotional abuse (*r* = .33) and physical neglect (*r* = .38) (CTQ), and total CTQ score (*r* = .41).	HSO mental health symptoms (CMS) were correlated with childhood emotional abuse (*r* = .55), physical neglect (*r* = .49) (CTQ) and total CTQ score (*r* = .52).
Yehuda et al., 2007b	HSO with parental PTSD reported significantly more negative consequences of being raised by Holocaust survivor parents than those without parental PTSD (*d* = 1.28) (CTQ).	
Yehuda et al., 2015	No significant differences in childhood trauma (CTQ) between HSO and JCO.	Findings suggest differential consequences of parental trauma versus offspring's own childhood trauma (CTQ) on epigenetic markers (methylation at different gene-sites).

Note. HS = Holocaust survivors; HSO = Holocaust survivor offspring; JCO = offspring of Jewish comparisons; AAI = Adult Attachment Inventory (Hesse. E, 1999); CAPS = Clinician Administered PTSD Scale (Blake et al., 1990); CS = Caregiving Scale, Scale especially designed for this study; CTQ = Childhood Trauma Questionnaire (Bernstein et al., 1997); FES = Family Environment Scale (Moos & Moos, 1994); LST = Lysozyme suppression test; NSPHQ = New Holocaust Survivor Parenting Questionnaire (Kellermann, 2001); PPRBQ = Perceived Parental Rearing Behaviour Questionnaire (Kellermann, 2001); CMS = Civilian Mississippi Scale (Keane et al., 1988); MIDBS = Maternal Inappropriate and Disorganizing Behavior Scale (Lyons-Ruth et al.,1999)

Parental Holocaust history

Five studies specifically addressed the association of having either one or two Holocaust survivor parents, and/or survivor gender with the offspring's mental health problems (see Table 4). Having two parents who were survivors of the Holocaust instead of one parent was significantly associated with more intrusive memories and other posttraumatic symptoms in the offspring group (Letzter-Pouw et al., 2014; Letzter-Pouw & Werner, 2013). Although being raised by *at least* one Holocaust survivor parent was associated with a risk of less optimal or adequate parenting in the study by Lehrner et al. (2014), no further data were provided on mental health outcomes related to which parent was a survivor in this study. Research of Letzter-Pouw and Werner (2013, 2014) indicated that offspring's mental health problems as well as their experience of parental trauma transmission, with transmission defined by the authors as the extent to which they received the inner pains of their parents, in turn causing them to feel responsible for their parents, was significantly more pronounced in cases when their mother was a Holocaust survivor compared to when their father was (small to medium effect sizes). The offspring reported more affection, more overinvolvement, and more 'transmission of the Holocaust' from their mothers than from their fathers (Letzter-Pouw et al., 2014).

Yehuda et al. (2008a) compared offspring with either a mother, a father or both parents with a life-time diagnosis of PTSD. Maternal PTSD was associated with a significantly higher prevalence of lifetime PTSD among offspring and the effect was stronger in the co-presence of paternal PTSD (medium effect size). Depressive disorder in offspring was significantly associated with maternal and/or paternal PTSD, while the effect was strongest when both parents had PTSD. In this study, Yehuda et al. (2008a) found a differential effect of parental PTSD on sons and daughters. Daughters of a father who had PTSD were more likely to develop PTSD, while sons with a father with PTSD were slightly less likely to develop PTSD (small effect size) (Yehuda et al., 2008a).

Finally in a study by Shrira et al. (2011), no significant differences were found between offspring with one or with both parents being Holocaust survivors, they did not differ with respect to self-reported health, life satisfaction and optimism and hope (Shrira et al., 2011). The absence of significant differences between HSO having either one or two parents with Holocaust exposure was also reported by Yehuda et al. (2001b). The studies agree, although with small to medium effect sizes, with our hypothesis that parental gender is associated with the impact of mental health problems in HSO. More specifically, the presence of Holocaust survivor mothers was related to a higher prevalence of HSO distress, anxiety disorders, mood disorders, and substance abuse than in JCO. Having two survivor parents instead of one increased the risk for (biological) vulnerability, stress sensitivity, and mental health problems in adulthood. This relationship was especially pronounced in the presence of maternal PTSD. Lifetime PTSD and depression in HSO were higher in the presence of maternal

PTSD and increased when paternal PTSD was also present. Daughters of a father who had PTSD were more likely to develop PTSD than sons of a father with PTSD.

Table 4

Having one or two survivor parents and parental gender and mental health complaints in HSO

Author	Results (assessment instruments) pertaining to one or two survivor parents and mental health outcomes in offspring	Results (assessment instruments) pertaining to parental gender and mental health outcomes in offspring
Letzter-Pouw et al., 2013	57.3% had two HS parents. Having two HS parents was associated with more intrusive memories (IES) (r = .38).	Perceived parenthood: HSO reported more affection (d = .28), over-involvement (d = .54), and transmission (d = .31) of the Holocaust from mothers than fathers, no differences between mothers and fathers on punishing (NHSPQ). Mother's transmission of trauma (NHSPQ) related to psychological distress (BSI). Mother's transmission of trauma (NHSPQ) was negatively associated with offspring psychological coping resources (MSS). Mother's transmission of the Holocaust (NHSPQ) related to intrusive memories (IES; r = .24). No association with perceived affection, punishment or over-involvement and no association with father's perceived parenthood (NHSPQ).
Letzter-Pouw et al., 2014	Sample one 57.0% had two HS parents. HSO who had two HS parents showed more posttraumatic symptoms (CAPS) than those with one HS parent (d = .34).	Sample one Mothers were perceived to transmit more burden to their offspring than fathers (NHSPQ) (d = .33). Both perceived transmission from mother and father (NHSPQ) were positively related with posttraumatic symptoms (CAPS). Sample two HSO perceived more transmission of burden from mother (d = .70) and father (d = .64) versus comparisons (NHSPQ).
Shrira et al., 2011	10.2% (n = 37) had one HS parent; 49% (n = 178) had two HS parents with a higher proportion of immigrants from Europe and the United States. There were no differences between both groups in health reports, life satisfaction or optimism and hope.	Not studied.
Yehuda et al., 2001b	No significant differences between offspring with one versus two parents with PTSD on CTQ scales.	There was a similar relationship between childhood trauma (abuse and neglect; CTQ total scores) and maternal (r = .45) and paternal (r = .39) PTSD symptoms.
Yehuda et al., 2008b	70.5% (n = 200) had two HS parents; of these 49 fathers had PTSD; 40 mothers had PTSD, while 35 HSO had two parents with PTSD. The relationship of HS exposure and mental health in HSO was not studied.	Prevalence of PTSD among offspring impacted by maternal, not paternal PTSD (PPQ, CAPS). Depressive disorder in offspring was significantly associated with paternal PTSD (48.1% compared to 17.6% in the comparison group) and/or maternal PTSD (46.3%) the effect cumulated when both parents had PTSD (56.9%). Females with a father who had PTSD were more likely to develop PTSD, while males with a father who had PTSD were slightly less likely to develop PTSD.

Note. HS = Holocaust survivors; HSO = Holocaust survivor offspring; JCO = offspring of Jewish comparisons; Correlation were only included when zero-order correlations were provided. SCID = Structured Clinical Interview for DSM IV Spitzer et al., 1995); STAI = Spielberger State-Trait Anxiety Inventory (Spielberger, 1968); CTQ = Childhood Trauma Questionnaire (Bernstein et al., 1997); FES = Family Environment Scale (Horowitz, 1979); PPQ = Parental PTSD Questionnaire (Yehuda et al., 2000).

Additional stress and traumatic life events in HSO

We found two studies with regard to the development of mental health symptoms resulting from additional stress and traumatic experiences (see Table 5). First of all, a study by Baider et al. (2006, 2008) distinguished four groups: An HSO and a non-HSO group either with or without a diagnosis of breast cancer. The results indicated that coping with breast cancer was significantly more strongly characterized by helplessness and hopelessness in the HSO than the non-HSO group (medium effect size) (Baider et al., 2006; Baider et al., 2008). They also scored significantly higher on measures of posttraumatic symptoms (i.e., intrusions and avoidance) as well as general psychological distress when faced with a diagnosis of breast cancer compared to non-HSO cancer patients (large effect sizes). The association between symptoms and being HSO was even stronger compared to the association between having symptoms and having a diagnosis of cancer. In addition, the cumulative effect of having Holocaust parents and a diagnosis of breast cancer was significantly higher than the impact of each single factor on symptoms of depression and psychoticism but not on other BSI subscales of distress or general level of distress. Thus, the psychological burden of cancer was larger for these women than for women with non-traumatized mothers, supporting the hypothesis of heightened vulnerability in HSO (i.e., but only for depression and psychoticism) (Baider et al., 2006, 2008).

Shrira (2015) and Shrira et al. (2011) demonstrated that the mere threat of a disaster in itself is not related to heightened stress levels in Holocaust survivor offspring. They conducted a study among Israeli civilian HSO and JCO on the perception of threat of an Iranian nuclear attack. HSO reported no significantly higher scores of anxiety than JCO and also revealed no more other mental health difficulties (medium effect size). Our hypothesis of higher vulnerability to additional stress in HSO is partly supported by the results of this limited number of studies that indicate that having a serious illness is accompanied with relatively high levels of distress in HSO, whereas the mere threat of a disaster is not differentially related to heightened distress in HSO (Shrira, 2015; Shrira et al., 2011).

Table 5

Heightened vulnerability to the development of mental complaints after additional stress and traumatic life events in HSO

Author	Additional stress/ traumatic life event HSO	Results (and instruments) pertaining to association between additional HSO exposure to stress/traumatic events, coping, and mental distress
Baider et al., 2006	Breast cancer	Psychological distress levels (BSI), intrusions and avoidance (IES), and helplessness/hopelessness coping (MAC) higher in HSO patients with breast cancer compared to non-HSO cancer patients. No difference on other coping styles (fighting spirit, anxious preoccupation, fatalistic acceptance (MAC). Effects of being HSO on most subscales of the BSI larger compared to effect of diagnosis of cancer (e.g., effect of being HSO generation (d = .76) compared to diagnosis of cancer (d = .49) on distress levels GSI scale BSI). Interaction between having breast cancer and being HSO on depression and psychoticism (BSI).
Baider et al., 2008	Breast cancer	GSI score (BSI) highest in HSO with breast cancer compared to other three groups. Controlling for the significant effects of mothers' distress and being a second-generation daughter, among others, the impact of cancer diagnosis on daughter level of distress was not significant (GSI index BSI).
Shrira et al., 2011	Cumulative life stressors	Cumulative life event distress (TEI) did not have more of an effect on middle-aged HSO relative to the comparison group. HSO seem to cope with stress as well as others.
Shrira, 2015	Iranian nuclear threat; and the perception of a hostile world	Iranian nuclear threat salience (constructed for this study) studied in two HSO samples ($n1$=106' $n2$=450) and related to anxiety symptoms (TMAS-S): among HSO, Iranian nuclear threat salience showed a strong relationship to anxiety symptoms. This relation was not mediated by a perception of the world as hostile by HSO.

Note. [a] partly same sample
HSO = Holocaust survivor offspring; IES = Impact of Event Scale (Horowitz et al., 1979); GSI = Global Inventory Index, based on BSI (Derogatis et al., 1982); MAC = Mental Adjustment to Cancer (Watson, 1988); HWS = Hostile World Scenario (Shrira et al., 2011); TEI = Traumatic Events Inventory (Shmotkin et al., 2009); THQ = Trauma History Questionnaire (Green, 1996); TMAS-S = Taylor Manifest Anxiety Scale – Short Form (Bendig, 1956).

Cortisol metabolism, epigenetic factors, genetic predisposition

Eleven studies reported about intergenerational effects on cortisol levels in offspring (see Table 6). Although no significant differences were found between 24-hr urinary cortisol levels between HSO and JCO, the results indicated that parental, and specifically maternal, PTSD (i.e., status and level of symptoms) was associated with lower 24-hr urinary cortisol levels in offspring, even after accounting for offspring's own traumatization and PTSD (Bader et al., 2014; Bierer et al., 2014; Lehrner et al., 2014; Yehuda et al., 2008a; Yehuda & Bierer, 2008b; Yehuda, et al., 2009; Yehuda et al., 2007a, 2001a, 2002; Yehuda et al., 2001b, 2007b). The general level of the 24-hr urinary cortisol level is lower in HSO of parents with PTSD than in HSO of parents without PTSD and lower than in JCO. Maternal PTSD had a significantly stronger association (medium effect sizes) with the lowering of this curve than paternal PTSD (Yehuda et al., 2007b). Most of these studies were conducted with maternal survivors so evidence for paternal impact is limited. The few studies that compared the impact of paternal and maternal PTSD in HSO revealed significantly lower 24-hr urinary cortisol levels

when either both parents or only mothers with PTSD were concerned than when only fathers had PTSD (medium effect sizes) (Bader et al., 2014; Lehrner et al., 2014; Yehuda & Bierer, 2008b; Yehuda et al., 2007a, 2007b). Lehrner et al. (2014) observed significantly higher 24-hr urinary cortisol levels and lower glucocorticoid sensitivity in HSO with only paternal PTSD (large effect size). Van IJzendoorn et al. (2013) described significantly lower levels of daily salivary cortisol in HSO in the presence of higher parental dissociation scores (large effect size). These results were confirmed by studies using dexamethasone concentrations (IC50-DEX value) to determine glucocorticoid sensitivity (Lehrner et al., 2014; Yehuda et al., 2007b). Bader et al. (2014) reported a significant association of 24-hr cortisol levels in HSO with the age of the mother during Holocaust exposure (large effect size). HSO with mothers who were adult during Holocaust exposure had significantly lower 24-hr urinary cortisol levels then HSO with mothers who were adolescents, children or JCO and this was independent of the presence of parental PTSD.

Heightened baseline cortisol levels in Holocaust survivors as a result of enduring stress might have exposed HSO to heightened intrauterine cortisol levels. To protect the unborn child from exposure to heightened cortisol levels of mother, placental 11β–hydroxysteroid dehydrogenase type 2 (11β-HSD-2) is being produced which neutralizes almost 90% of maternal cortisol (Duthie & Reynolds, 2013). 11β-HSD-2 activity was significantly higher in HSO with mothers exposed to the Holocaust during childhood compared to JCO. Also, HSO without maternal PTSD showed significantly higher 11β-HSD-2 activity compared to HSO with maternal PTSD and JCO (Bierer et al., 2014). This remained significant when paternal PTSD was included. In this study, it appeared that maternal age at exposure, exposure during childhood, rather than maternal PTSD, predicted offspring's 11β-HSD-2 activity (medium effect sizes).

Recent studies have focused on epigenetic mechanisms and PTSD. Alterations were found in relation to parental PTSD on DNA methylation and its relationship to glucocorticoid receptor sensitivity (Yehuda et al., 2016). The study by Yehuda et al. (2016) demonstrated methylation changes (large effect sizes) at the FKBP5 gene, in the opposite direction, survivors had significantly higher and HSO significantly lower methylation. This was not significantly associated with the FKBP5-risk-allele and could not be attributed to offspring's own trauma exposure, offspring's psychopathology, cortisol levels or demographic characteristics that might independently affect methylation of this gene. Maternal or paternal influences on *in utero* effect could not be differentiated because both parents were Holocaust survivors in this sample. According to the results described above, it can be concluded that parental Holocaust trauma may affect offspring's cortisol metabolism. Maternal symptoms as PTSD and dissociation give rise to decrease of cortisol levels, but maternal atrocities during childhood give rise to increase of cortisol levels, increased 11β-HSD-2 activity in HSO and increased FKBP5 gene methylation. The findings of these psychobiological

markers showed a significant contribution to intergenerational consequences on HSO. The epigenetic consequences (FKBP5 methylation) with large effect sizes seem to contribute to a larger part than the other psychobiological markers with medium effect sizes.

Table 6

Biological parameters: Cortisol, epigenetic factors and genetic predisposition

Author	Sample	Results on offspring biological parameters	Results pertaining to association between parent and offspring cortisol metabolism and epigenetics
Bader et al., 2014	*N* = 69	No significant difference in 24-hr urinary cortisol levels between HSO and JCOES *r* = 0.106 *d* = 0.21.	Controlled for age, gender, and current depressive disorder, maternal age at Holocaust and maternal PTSD (*d*= 0.43) were independent predictors of lower offspring urinary cortisol, whereas offspring childhood adversity and offspring PTSD symptoms were not.
		Significant difference offspring of mothers who were adults (low) and who were children (high) (*p* = 0.028) and trend between offspring of mothers who were adults and of not exposed (JCO) (*p* = 0.069).No significant difference in each combination between HSO with mothers exposed in childhood and in adolescence or not exposed	No interaction of effect of PTSD and maternal age of exposure.
		Significant main effect of maternal PTSD on HSO urinary cortisol *p* = 0.014.	No relation of mother's age at birth with cortisol levels in HSO.
			Significant effect of maternal PTSD on HSO 24-hr cortisol levels (lower levels when mother had PTSD).
Bierer et al., 2014	*N* = 85 female HSO*N* = 27 female JCO	24-hr cortisol level HSO lower than JCO *p* =.046 *d* = 0.45 and 5α-THF *p* = .084 *d* = 0.34Total glucocorticoid *p* = .057 *d* = 0.43.	11β-HSD-2 activity significantly elevated in HSO when mothers exposed to Holocaust in childhood.
		Significant difference in 11β-HSD-2- activity between maternal exposure in childhood and JCO *p* =.029.	No effect of gender on 11β-HSD-2 activity.
		HSO showed trend significant lower levels of cortisol, 5α-THF (major metabolite of cortisol) and total glucocorticoids compared to JCO. No sign differences in the levels of other metabolites.	Maternal age of exposure, rather than maternal PTSD, predicted offspring 11β-HSD-2 activity.
		11β-HSD-2 activity was higher between HSO mothers without PTSD than with PTSD and JCO *p* =.009, also significant after including father with PTSD as covariate *p* = .008.	

Table 6 *Continued.*

Author	Sample	Results on offspring biological parameters	Results pertaining to association between parent and offspring cortisol metabolism and epigenetics
Lehrner et al., 2014	*N* = 95 HSO *N* = 26 JCO	HSO with maternal PTSD significantly lower $IC_{50\text{-}DEX}$ (≈ higher glucocorticoid sensitivity) than paternal PTSD without maternal PTSD Paternal PTSD significantly higher $IC_{50\text{-}DEX}$ than HSO without parental PTSD Maternal PTSD only HSO cortisol suppression on DST 69.75%, both parents PTSD 82.49% Paternal PTSD higher 24-hr urinary cortisol levels in HSO than when both parents or only mother with PTSD	Maternal PTSD associated with higher glucocorticoid sensitivity and lower 24-hr urinary cortisol excretion in HSO. This was the same when both maternal and paternal PTSD was present.When only the father had PTSD, an opposite effect was observed lower glucocorticoid sensitivity and higher 24-hr urinary cortisol excretion.
Van IJzendoorn et al., 2013	*N* = 29 survivor parents *N* = 45 HSO daughters *N* = 29 matched JC non-survivor parents *N* = 29 JCO daughters All female and living in Israel	No sign difference in cortisol levels of HSO compared to non-HSO Higher dissociation in HS was associated with lower total daily cortisol production in HSO compared to HS with lower dissociation (*d* = 0.73)	Lower levels of daily salivary cortisol in HSO when surviving parents displayed higher scores on dissociation (DES).
Yehuda et al., 2001b	*N* = 51 HSO*N* = 41 JCO	*N* = 20 HSO + parental PTSD (24-hr cortisol secretion *M* = 42.06 *SD* = 29.82)*N* = 8 HSO no parental PTSD (24-hr cortisol secretion *M* = 67.90 *SD* = 29.82) *p* = .021 (*d* = 0.895).	24-hr Urinary cortisol excretion significantly lower in offspring with parental PTSD compared to offspring without parental PTSD and JCO. Emotional abuse and parental PTSD appear to be associated with low cortisol and risk for PTSD.
Yehuda et al., 2002	*N* = 39 HSO*N* = 15 JCO	Offspring cortisol levels significantly associated with sum of PTSD symptoms severity of father and mother combined *r* = 0.40.	24-hr Urinary cortisol levels in HSO were associated with parental PTSD symptoms as much as with their own PTSD symptoms.
Yehuda et al 2007a	*N* = 16 JCO*N* = 25 HSO	*N* = 12 HSO no parental PTSD*N* = 13 HSO + parental PTSDhigher cortisol DEX suppression in HSO with parental PTSD than without parental PTSD ($p < 0.04$, *d* 0.93) or JCO ($p < 0.03$, *p* 0.91) but not significant between HSO without parental PTSD and JCO $p < 0.54$.	an association persisted between cortisol suppression and parental PTSD after controlling for childhood trauma and HSO own PTSD.

Table 6 *Continued.*

Author	Sample	Results on offspring biological parameters	Results pertaining to association between parent and offspring cortisol metabolism and epigenetics
Yehuda et al 2007b	*N= 33 HSO* *N= 16 JCO*	*N* = 23 HSO with parental PTSD *N* = 10 HSO no parental PTSDThe estimated mean ± SE plasma cortisol levels were 8.92 ± .41 µg/dL JCO, 8.84±0.52 µg/dL for offspring without parental PTSD, and 7.23±0.35 µg/dL for offspring with parental PTSD.	When the whole sample was considered, there was a significant association between mean cortisol levels and severity of parental PTSD (*r*42 = −0.41; *P*=.006) that was reduced when only Holocaust offspring were considered (*r*26 = −0.39; *P* = .04) and was further reduced to non-significance when examined in the smaller offspring subgroup with parental PTSD (*r*16 = −0.36; *P* = .14). Offspring with paternal PTSD only were not significantly different in mean cortisol level than offspring with no parental PTSD or comparison subjects. Mean cortisol levels were similar for offspring with PTSD in both parents and those with maternal PTSD only, whereas both groups differed from offspring with no parental PTSD (*P* = .02 and *P* = .045, respectively) and from comparison subjects (*P* = .009 and *P* = .02, respectively).
Yehuda & Bierer 2008b	*N*= 41 HSO*N*= 19 JCO	*N* = 6 only paternal PTSD and *N* = 16 no parental PTSD mean 24-hr urinary cortisol level no significant difference.*N* = 9 both parents PTSD and *N* = 8 only maternal PTSD similar mean 24-hr urinary cortisol and differed from no parental PTSD and JCO.HSO and maternal PTSD lower 24h urinary cortisol than JCO *p* = .021; HSO without maternal PTSD trend lower level than JCO *p* =.081. The inverse correlation of cortisol and maternal overprotection in HSO with maternal PTSD differed significantly from the weakly positive association of these variables in HSO without PTSD (*p* = .012) and JCO (*p* = .022).	Significant negative association maternal PTSD with offspring mean cortisol.

Table 6 *Continued.*

Author	Sample	Results on offspring biological parameters	Results pertaining to association between parent and offspring cortisol metabolism and epigenetics
Yehuda et al., (2014)	*N=120 HSO N*= 75% HSO both parents exposed *n = 53 (55.8%)* maternal exposure *n = 43* (44.2%) HSO paternal exposure *n = 15* JCO no parental PTSD	In the absence of maternal PTSD, offspring with paternal PTSD only showed higher GR-1F promotor methylation, whereas offspring with both maternal and paternal PTSD showed lower GR-1F promotor methylation (t=3.49, df=86, p<0.05). GR-1F promotor methylation was negatively correlated with GR-1F expression (% methylation: N=73, r=20.35, p<.01; number of methylated sites: N=73, r=20.36, p<.01), indicating the validity of the GR-1F promotor methylation procedures.	Offspring with maternal PTSD demonstrated elevations in poor perceived emotional health and depression symptoms and trait anxiety. Offspring with paternal PTSD only tended to endorse a dismissing, fearful, or insecure attachment style, as well as greater childhood trauma exposure, greater dissociative experiences, and greater sensitivity to violence. Offspring with both maternal and paternal PTSD were more likely to report a subjective feeling of having psychological scars, being affected by vicarious (Holocaust-related) trauma and having greater sensitivity to violence and/or injustice, as well as more dissociative amnesia. Adding GR-1F promoter methylation to the clustering analysis demonstrated that this variable integrated with maternal PTSD-related phenotypic measures. Maternal and paternal PTSD were associated with different clinical and perceived childhood characteristics. Maternal PTSD was associated with higher self- reported depressive symptoms and trait anxiety and lower perceived emotional health. Paternal PTSD was associated with higher reports of childhood trauma and less adaptive attachment styles. There were no significant interactions between maternal and paternal PTSD on any of the clinical measures.

Table 6 *Continued.*

Author	Sample	Results on offspring biological parameters	Results pertaining to association between parent and offspring cortisol metabolism and epigenetics
Yehuda et al., (2015)	*N* = 32 survivor parents *N* = 22 HSO*N* = 8 JC parents *N* = 9 JCO	HS bin/3site 6 methylation correlated with HSO methylation at the same site (*r* = .442 *p* = .01). Parental Holocaust exposure significant predictor of HSO bin/3site 6 methylation (*p* = .034) parental PTSD and *FKBP5* risk-allele, childhood adversity and emotional abuse were not significant associated. FKBP5 methylation is seen in Holocaust survivors (higher than comparison) and their offspring (lower than comparison) on the same site in a functional intronic region of *FKBP5* in the opposite direction. Bin/3site 6 methylation Holocaust exposed correlated with HSO methylation at the same site, the presence of *FKBP5* risk-allele in both generations did not substantially alter the association of bin 3/site 6 methylation between survivor and offspring (r = .438, p= .014) or within Holocaust-exposed families (r = .559, p = .008).	No significant associations were found of the FKBP5 risk-allele with HSO own psychopathology, trauma-exposure or other examined characteristics that might independently affect methylation of this gene.

Note. HS = Holocaust survivors; HSO = Holocaust survivor offspring; JCO = offspring of Jewish comparisons; 11β-HSD-2 = 11β-hydroxysteroid-dehydrogenase type 2; FKBP5 = FK506-binding-protein-5 gene; PBMCs = peripheral blood mononuclear cells; $IC_{50\text{-}DEX}$ = concentration at which lysozyme activity is diminished by 50%; DST = dexamethasone suppression test.

DISCUSSION

The aim of this review was to increase our understanding of the impact of being raised in a family with Holocaust survivor parents on the mental health of their offspring. We conducted a systematic literature search and included 23 studies published between January 2000 and February 2018. Because of the large heterogeneity in the type of samples across the reviewed studies (e.g., only offspring or both parents and offspring, heterogeneity in comparison groups) and the large heterogeneity in the mechanisms of interest and associated measurement instruments (i.e., varying from attachment interviews to biological parameters), this systematic review was restricted to a qualitative approach (Aromataris & Munn, 2017).

This systematic review focused on the following factors that may contribute to this multi-causality: (a) parental mental health problems; (b) (perceived) parenting and attachment; (c) parental Holocaust history; (d) the occurrence of lifetime HSO stressors; and (e) cortisol metabolism, epigenetic factors, and genetic predisposition. Overall, we found that inter-generational consequences may be best understood by the impact of (and interaction between) multiple factors, and not by one single factor determining mental health outcomes in offspring.

a. *Association between parental and offspring's mental health problems*. The hypothesis of increased prevalence of psychiatric symptoms in offspring because of parental symptoms is confirmed by the findings. Parental mental health problems were clearly found to be associated with offspring's mental health problems, in particular with regard to the occurrence of HSO mood disorders, anxiety disorders, and substance abuse. Especially parental PTSD was associated with PTSD and depressive symptoms in HSO. This last result is in line with the conclusion of the review by Leen-Feldner et al. (2013) that parental PTSD is associated with offspring PTSD.
b. *Perceived parenting and attachment*. As we expected, several factors related to (perceived) parental parenting and attachment were also found to be related to psychological functioning and mental health problems in offspring. HSO families were characterized by relatively many and/or intense conflicts within families and by less cohesion. Survivor mothers were perceived as being more over-involved than fathers and in the presence of parental PTSD, there was an increased risk of emotional and physical abuse or neglect.
c. *Parental Holocaust history*. The hypothesis that growing up in a two-survivor family versus a one-survivor family and the gender of the survivor will affect the incidence of mental health problems in offspring was confirmed. The results of the studies indicated that overall Holocaust survivor mothers appeared to be more influential for the mental well-being of their offspring than fathers. In addition, having two survivor parents resulted in higher mental health problems compared to having one survivor parent. This pattern appeared evident even if parents did not show mental health problems. As we expected, findings are consistent with the view that the parental Holocaust history is associated with the development of symptoms, and especially strong when maternal PTSD is present.
d. *Additional stress and traumatic life events in HSO*. Empirical support for the hypothesis of heightened vulnerability to stress in HSO after serious life events is consistent but limited. The results of one study among HSO with cancer indicated that having a serious illness (e.g., in case of cancer) was accompanied but with higher levels of distress. In contrast to what was expected, HSO and JCO showed the same heightened vulnerability for stress in case of mere threat (e.g., nuclear threat).
e. *Cortisol metabolism, epigenetic factors, and genetic predisposition*. As a last factor of inter-generational consequences of trauma, we reviewed studies on cortisol metabolism, epigenetic factors, and genetic predisposition. The studies demonstrated intergenerational effects with regard to cortisol levels (with lower urinary cortisol levels in offspring whose mothers were adults during the Holocaust compared to offspring of younger mothers), increased methylation in specific gene-segments (FKBP5), and increased 11β–HSD-2 activity with maternal PTSD. These findings are in line with studies focusing on epigenetic and physiological consequences of other forms of mass violence and stress such as the 9/11 terrorist attack (Yehuda & Bierer, 2008b). Overall, we found indications that special attention should be paid to maternal age at exposure and parental PTSD because each may affect different components of the cortisol metabolism and bring about various changes in cortisol metabolism.

An integrative perspective

To understand intergenerational consequences of massive trauma an integrative perspective is needed. This perspective needs to include psychological, family system, and biological and sociological characteristics. It should also be noted that intergenerational consequences do not necessarily lead to psychological symptoms (Denham, 2008; Kirmayer, Gone, & Moses, 2014). However, despite the caveats in the studies included in this review, the findings provided considerable evidence in support of the hypothesis that HSO is indirectly affected by the Holocaust experiences of their survivor parents. There was also evidence that the psychobiological systems changed in response to severe stress related to Holocaust experiences: Children with mothers who have experienced the Holocaust developed an altered cortisol metabolism due to epigenetics increased FKBP5 methylation and increased 11β–HSD-2 activity. This may provoke altered reactions to stress in HSO compared to offspring with unchanged cortisol metabolism. Depending on the type of cortisol metabolism modification, this may give rise to heightened vulnerability to stress, distress and mental symptoms but it may also bring about resilience and even increased resistance to stressful events (Bonanno & Mancini, 2012; Harel et al., 1988).

Furthermore, in the presence of parental mental disorders, especially maternal PTSD, offspring is vulnerable to developmental problems. And less attuned parenting, family conflicts, and emotional abuse have been found to be occurring relatively often in Holocaust survivor families. Only little evidence was found for HSO to be vulnerable to traumatic or stressful life events that really happened and not to mere threat.

Methodological issues

The strength of this study is that we have systematically analyzed all empirical studies that have been published on intergenerational consequences of the Holocaust in the past two decades. Further, we evaluated characteristics, including parental mental health problems, perceived parenting, gender, additional life-time stress, cortisol and epigenetics, that were only partly addressed in previous reviews within this domain.

A limitation of the current findings is that only a restricted number of researchers have addressed intergenerational consequences. Thus, the studies included in this

review were designed and carried out by only a small group of scientists. Further empirical studies and replications among offspring of war survivors by a larger variety of research groups are of great importance. Another limitation is that we narrowed our focus to a selection of possible influential intergenerational factors. This selection was based on both theoretical hypotheses and factors that were proposed in earlier research (e.g., Felsen, 1998; Kellermann, 2001; Solomon, 1998; Van IJzendoorn et al., 2003). Nevertheless, there may be other relevant factors that have not been covered by the current study. For example, the birth order and the presence or absence of siblings may have an impact on the development of the HSO mental health (Kellermann, 2008; Letzter-Pouw & Werner, 2013). Examples of other factors that we did not consider and that might be of influence are: the migration history and the circumstances in the host countries; the current living conditions of feeling safe and welcome or living in a condition of continuing threat as in Israel or the influence of living among a high percentage of Holocaust survivors (Kirmayer et al., 2014).

The recruitment methods that were used in the reviewed studies varied from convenience samples (e.g., gathered through advertisement, survivor associations or networks, meetings or conferences, mental health clinics) and snowball methods to a more representative selection of participants (e.g., random selection from national case register such as the Ministry of Interior; Sagi-Schwartz et al., 2003). Both convenience sampling and representative sampling methods have advantages and disadvantages. In our review, we focused on the clinical group of HSO, which is obviously not representative of the total population of HSO. The choice was made because the sample of clinical HSO was expected to show sufficient variation in mental health problems allowing to investigate a possible association between symptoms and parental as well as offspring characteristics. Thus, studying this group could contribute to a better understanding of underlying mechanisms for presumed transmission of parental-experienced massive trauma. Furthermore, samples by recruitment with the use of a national case register suffer from low response rates (e.g., 60% in a study by Letzter-Pouw et al., 2014) and therefore reduce representativity. Participants may refuse to participate because, for example, they do not want to be reminded of the war, they feel that the Holocaust did not play a significant role in their lives, or they are afraid to become too emotional. Consequently, selective non-response may have introduced bias in the results gathered and reported (Letzter-Pouw et al., 2014; Letzter-Pouw & Werner, 2013).

Additionally, the Jewish comparison samples in the reviewed studies were from the same catchment area but with parents who were non-Holocaust survivors. These samples varied widely, depending on the method of recruitment and in- and exclusion criteria possibly introducing selection bias. The comparison samples included further differed in health status (e.g., from completely symptom-free to general population samples with selected exclusion criteria like florid psychotic disorders). Moreover,

despite careful screening procedures, comparison survivor and offspring groups were not always comparable on important demographic variables like education level (e.g., non-Holocaust survivors received more education during the holocaust years), religion, or background of partner (Holocaust survivor or not).

Most studies reviewed were one-generation studies (i.e., with an absence of direct assessments in the first-generation survivors) and mental health functioning and other survivor characteristics (e.g., perceived parenthood) were estimated by the HSO, introducing retrospective bias. Symptoms of PTSD may change over time and the current symptoms or the symptoms during the last period of the parents' lives may be more explicit in memory and therefore no proper representation of the symptoms during the earlier or entire upbringing period. Moreover, in the few two-generations studies the associations between survivor and offspring functioning were not always computed. Finally, it is important to mention that all studies that met our inclusion criteria pertained only to Holocaust survivors. Offspring of parents who survived World War Two by hiding or in the resistance, as well as parents who survived the Japanese occupation and internment camps in Asia were not represented. This reduces the external validity, that is, the generalizability of the findings of the current review to other survivors of World War Two and survivors of other atrocities or war as well as other groups with severe parental trauma. We also have to keep in mind that Holocaust survivors might have lived in more hospitable or stable countries than the circumstances of refugees now living in temporary housing in refugee camps or unhospitable and unstable host countries.

Clinical implications and implications for future research

First of all, this research has implications with regard to diagnostic assessment. The findings of this review indicate that intergenerational effects may not be directly observed in the occurrence of particular disorders in offspring but appear to be reflected by a diversity of mental health problems that are influenced by both parental and offspring characteristics. Diagnostic procedures should thus take this into consideration and incorporate instruments capturing this variety of symptoms and contributing factors. In addition, to minimize intergenerational consequences for children with severely traumatized parents (e.g., refugees), treatment should be provided to both survivor and offspring for their mental health problems. Also, the findings emphasize the importance of providing support for traumatized parents in raising their children (see also van Ee et al., 2013).

For future research, it is important to examine if specific characteristics of Holocaust survivors are also evident in survivors of genocide or survivors of war in general (Kirmayer et al., 2014). More insight into the presence of intergenerational consequences of war does not have to be limited to HSO but can also be developed in prospective research among survivors of current wars such as in Syria or in refugee

camps. Studies entailing a longitudinal design incorporating both psychosocial and psychobiological parameters will be of great value to closely examine interference of parental characteristics with the development of offspring. Because most studies reviewed by us relied on cross-sectional designs, longitudinal research is of great importance because the consequences of parental trauma may only become visible after a long time. Our review also made clear that it is relevant not to limit future studies to offspring that experienced warfare or was born during the war but also focus on children born after the war, as (intergenerational) consequences sometimes may only become evident many years after traumatic war events. This will contribute to increasing insight on child, parental and parenting factors as well as on their mutual influence. The focus on malleable factors can be used as a starting point for (preventive) interventions.

Conclusion

To conclude, the available evidence suggests that both parent and child characteristics and their interaction contribute to the vulnerability and to the development of symptoms in the HSO group. Holocaust survivor mothers have been observed to be more influential for the mental well-being of their offspring than fathers, and having two survivor parents resulted in even higher mental health problems. This is confirmed by studies of intergenerational effects with regard to parental PTSD and maternal age during the Holocaust. Those studies showed strong evidence for the effect on cortisol metabolism modification and epigenetics in HSO with survivor mothers. Also, intergenerational effects have been found with regard to cortisol levels. There is some empirical support for a heightened vulnerability for stress in HSO. These results indicate that diagnostic procedures and treatment, but also future theorizing and empirical studies should be multifactorial in trying to delineate the causal factors involved in mental health functioning in intergenerational consequences of war. In this context, it is important to note that, although the current review has predominantly focused on HSO suffering from mental health problems, it is relevant to examine those parents and children who managed to cope, adjust and/or build a healthy life, as this might help unveil factors contributing to resilience. Attention should be paid to these specific psychological and biological factors safeguarding offspring against distress.

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Disclosure statement

No potential conflict of interest was reported by the authors.

APPENDIX

The search syntax was: (Second World War or World War II or World War 2 or WWII or WW2 or Worldwar-2 or Worldwar-II or World War Two or 2WAR2 or Holocaust) and (Child* of Holocaust Survivor* or child* of concentration camp survivor* or second generation or adult offspring) and (adult offspring/ or daughters/ or sons/) and (Acute Stress or C*PTSD or chronic trauma* or Combat disorder* or combat fatigue or Combat Neuros#s or combat stress or Complicated Trauma* or comorbid* or Complex trauma* or DES*NOS or "Disorders of Extreme Stress" or Dual Diagnos#s or emotional trauma* or Enduring Personality Change after Catastrophic Experience* or EPCACE or Multiple Trauma* or posttraumatic neuros#s or post-traumatic neuros#s or posttraumatic psychic syndrome* or post-traumatic psychic syndrome* or posttraumatic psychos#s or post-traumatic psychos#s or posttraumatic stress or post-traumatic stress or posttraumatic syndrome* or post-traumatic syndrome* or Psychotrauma* or PTSD or shell shock or traumati#ed or traumatic stress or Type II trauma* or Type I trauma* or war neuros#s).ti,ab.) and (Posttraumatic Stress Disorder/ or Emotional Trauma/ or acute stress disorder/ or combat experience/ or trauma/ or traumatic neurosis/) and (depress* or melanchol* or low mood) And (Anxiety Disorder* or panic disorder* or anxiety symptom* or panic symptom* or Anxiety attack* or panic attack* or Agoraphobia) and (exp Anxiety Disorders) and (neurotic depression* or dysthymic disorder* or chronic depression* or mood disorder*) and (exp Dysthymic Disorder) and (eating disorder* or anorexia nervosa or bulimia nervosa or Compulsive overeating or Diabulimia or Drunkorexia or Gourmand syndrome) and (exp Eating Disorders) and (Personality disorder* or obsessive-compulsive disorder or borderline or Paranoid or Schizoid or Narcissistic or Histrionic or Schizotypal or antisocial or avoidant or masochistis or sadistic or negativistic) and (exp Personality Disorders) and (exp Drug Abuse/ or exp addiction) and (addict* or alcohol* or Amphetamine or Angel Dust or Binge Drinking or Cannabis or Cocaine or Delirium Tremens or dependen* or Drug Abus* or Drug Addicti* or Drug Dependen* or Drug Habit* or Drug Overdose* or Drug psychos* or "Drug Use disorder*" or Drug Withdrawal or Drunkenness* or Ethanol or FAE* or FASD* or Glue or Hashish or Heroin or Inhalant abus* or Intravenous Drug* or Intravenous Substance* or Marihuana or Morphine or Narcotic* or Neonatal Abstinence or Nicotine or Opiate* or Opioid* or PCP abus* or Phencyclidine or smoker* or Smoking* or Substance abus* or Substance addict* or Substance dependen* or Substance Induced or "Substance Use" or Substance-Induced or Substance-Related or Tobacco or Withdrawal) and (somatization/ or exp somatoform disorders) and (somati?ation* or somatoform or Body Dysmorphic Disorder or Conversion Disorder or Hypochondriasis or Neurasthenia or Neurodermatitis or Somatization Disorder or Somatoform Pain Disorder) and (mental disorder* or mental illness or psychological disorder* or psychiatric disorder*) and (exp Mental Disorders) and (exp Symptoms) and (Arousal or Hyperarousal or Avoidance or Reexperienc* or Intrusion or Reliv* or nightmare* or sleep* or flashback* or belief* or feeling*) and (Comorbidity) and (comorbid* or Multiple Disorders or Dual Diagnosis) and (exp Mental Health/ or Well Being/ or exp "Quality of Life") and (mental health or well-being or Quality of Life) and (exp social identity/ or identity formation/ or Identity Crisis/ or exp Separation Anxiety/ or exp Separation Reactions/ or exp Separation Individuation) and (identit* or individuation or separation) and (Heredity or genetic* or epigenetic* or Epigenomic* or cortisol or Hydrocortisone or Epicortisol or 11?Epicortisol or Cortifair or Cortril or neurobiolog* or neuropsycholog* or DNA or Deoxyribonucleic Acid or biomarker* or ((Biologic* or Biochemical or Clinical or Laboratory or Serum or Viral or Immunologic or Immune or Surrogate) adj (end?point* or Marker*)) or phenotype*) ti,ab.and (exp Genetics/ or Hydrocortisone/ or exp Neurobiology/ or Neuropsychology/ or DNA/ or Biological Markers/ or Phenotypes

CHAPTER 3

Intrusions related to indirectly experienced events in clinical offspring of World War Two survivors

Based on:
Dashorst, P., Huntjens, R.J.C., Mooren, T.M., Kleber, R. J., Zu Eulenburg, C., & de Jong, P.J. (2020). Intrusions related to indirectly experienced events in clinical offspring of World War Two survivors. *Journal of Anxiety Disorders, 71*, 102209.

ABSTRACT

Background

Negative events may not only linger on in the form of intrusive memories in the minds of those directly exposed but also in those who are only indirectly confronted with these events. The aim of the present study was to investigate if intrusions referring to indirectly experienced traumatic events do indeed occur, and to compare their frequency and characteristics to intrusions about directly experienced negative events.

Methods

Participants (*N* = 98) were adult postwar offspring of World War Two survivors currently in treatment in one of two clinics specialized in the treatment of war victims. We examined the frequency and characteristics of intrusions about indirectly experienced (i.e., parent war-related) events and two types of directly (self-)experienced events: Self-experienced traumatic events and negative events related to participants' upbringing.

Results

Intrusions referring to indirectly experienced traumatic events did indeed occur. The frequency as well as other characteristics of these intrusions did not differ from those of both types of intrusions about directly experienced events.

Conclusion

The similarities between intrusions related to different types of events emphasize the (re)constructive nature of memory. Our findings indicate that traumatic events not only affect those directly involved but may also continue to plague the next generation.

INTRODUCTION

Ubiquitous in human life is the experience of negative events like the death of a loved one, physical and sexual abuse, war and violence, and natural disaster. Almost 90 % of adults have experienced at least one very negative or traumatic event in their life (Kessler et al., 1995; Kilpatrick et al., 2013). For some, these events linger on in their mind, long after the event took place, in the form of recurrent, involuntary intrusive memories of the event. Such distressing involuntary memories which often have a 'here and now' quality, can have a large impact on the mental health of those involved and are a feature of several mental disorders including posttraumatic stress disorder (PTSD) and depression (e.g., Williams & Moulds, 2007). An important question is whether these distressing memories only affect those *directly* involved, or whether intrusions are also experienced by family members, friends, and/or colleagues of those involved by way of *indirect* exposure to the traumatic event. In the DSM-5, the A-criterion for PTSD has been extended to include, in addition to directly experiencing a traumatic event or witnessing it in person, learning that the potentially traumatic event occurred to a close family member or friend as potentially traumatic. In addition, the criterion also incorporates repeated or extreme exposure to aversive details of the event after it took place (e.g., first responders collecting human remains; police officers repeatedly exposed to details of child abuse) (American Psychiatric Association (APA) (2013)).

Clinical observations have suggested that those who indirectly experienced or witnessed a stressful event can develop intrusions. Intrusions have, for example, been reported by those whose loved ones have been murdered (Rynearson & McCreery, 1993) and by people whose relatives were hospitalized for burn injuries (Cella et al, 1988). However, despite these clinical observations, systematic empirical study of intrusions in people who did not directly experience or witness a traumatic event is scarce. More systematic empirical research is needed to identify the possible occurrence and characteristics of intrusions related to indirectly experienced events and compare these to the occurrence and characteristics of directly experienced events. Are indirect intrusions similar in emotional intensity, valence and sensory or cognitive contents? Such information is needed to grasp the breadth of the impact of negative events in society and is pivotal to the work of healthcare professionals around the world.

Most models about the development and persistence of intrusive memories have been developed in the context of PTSD and focus on directly experienced traumatic events (Brewin et al., 1996; Ehlers & Clark, 2000; Foa & Rothbaum, 1998). A common feature of these models is that they postulate a *special memory mechanism* emphasizing the factors that operate at the time of encoding of the traumatic event and affect the memory of the traumatic event. For example, the influential cognitive model of Ehlers and Clark (2000) implies that the trauma memories are poorly elaborated and

inadequately integrated into context (i.e., time and place) and that intrusive memories are triggered not by conceptual but by perceptual cues temporally associated with the traumatic event (i.e., which bear a physical resemblance to cues present shortly before or during the traumatic event) (Brewin & Holmes, 2003; Dalgleish, 2004). These models emphasize the importance of special memory mechanisms operating at the moment of directly (i.e., personally) experiencing traumatic events, and can thus not account for the possible occurrence of intrusive memories related to events that people did not experience themselves. Moreover, they cannot readily explain intrusions referring to events in the future, including involuntary future cognitions (for a review see Berntsen, 2019) and flashforwards in clinical disorders (e.g., Hales et al., 2011; Holmes et al., 2007; Ivins, Di Simplicio et al., 2014). Also, these models do not readily explain the finding that intrusions referring to personally experienced events are not always exact representations of the event but sometimes include imagined details (worst-case scenarios, thoughts or images about non-experienced details of the event, memory amplification or other hypothetical reconstructions (Bryant & Harvey, 1998; Ehlers et al., 2002; Grunert et al., 1988; Merckelbach et al., 1998; Oulton et al, 2018; Reynolds & Brewin, 1998).

A model that could help explain the possible occurrence of intrusions about indirectly experienced negative events and other re-constructed intrusions is the so-called *mnemonic model* (Rubin et al.,2008). Rather than focusing on aberrant encoding processes operating at the time of experiencing the negative event, this model emphasizes the (re)constructive nature of memory retrieval. This process is influenced by many factors, hence the memory is subject to change over time rather than reflecting an indelible account of the negative event. This *mnemonic model* thus implicates that post-event memory processes are decisive for the development of intrusions. It is the interaction between memory (re)construction and the many factors influencing this process (e.g., individual differences like neuroticism and a person's current attitudes and goals) that determines whether intrusions will develop. Although not constructed specifically to explain indirect intrusions, the emphasis on memory construction in this model opens the door to the possibility of the development of intrusions based on events that people did not experience themselves. In addition, the mnemonic model predicts that the characteristics (e.g., frequency, controllability) of such intrusions do not differ from intrusions based on personally experienced events.

Most of the empirical research so far has focused on people having directly experienced or witnessed a traumatic event. Participants not meeting this criterion (i.e., experiencing traumatic events indirectly) have usually not been included in intrusion studies. This group of participants, however, would be crucial for testing our assumptions of intrusions associated with indirect experiences based on the mnemonic model (Rubin et al., 2008). A highly relevant population in this regard is the adult offspring of World War Two survivors. Several studies have indicated that children of Holocaust survivors, born after World War Two, display mental health problems, such as depression, anxiety, maladaptive behaviour, attachment problems, and symptoms of personality disorder (Danieli et al., 2017), and some studies have emphasized a similarity of symptoms in now adult offspring to those experienced by their parents (Sagi-Schwartz et al., 2003; Van der Velden et al., 1994; Van IJzendoorn et al., 2003). In a study of 56 adult offspring of Holocaust survivors, seven percent reported that the Holocaust stories of events that occurred to their parents caused them great distress (Wiseman et al., 2002). More specifically, they reported being too young to handle both the graphic information about murder, torture and rape as well as the emotional responses of the parents while they were reliving these experiences. Subsequently, they either imagined their parents re-experiencing these events or "applied" the events to themselves. Furthermore, about one-fourth of the offspring mentioned their Holocaust-related upbringing as very distressing. Examples included emotional and/or physical neglect of the child by a parent, the responsibility of caring for a parent at a young age, the minimizing of the offspring's own life experiences in contrast to the Holocaust, and being taught by a parent to fear the environment (Yehuda et al., 1998).

To our knowledge, no research to date *systematically* compared the occurrence, content, and characteristics of intrusions in offspring related to the stressful events experienced by their parents, compared to personally and directly experienced stressful events and/or negative events related to their upbringing.

THE PRESENT STUDY

The aim of the present study was to systematically investigate the possible occurrence and characteristics of intrusions about events that were not directly experienced or witnessed. We conducted a questionnaire assessment in a clinical sample of adult offspring of World War Two survivors, who were born after the war was ended. The parents of these children were survivors of the German or Japanese concentration and internment camps during World War Two, and their offspring were in treatment in one of two centers specialized for war-related problems. We investigated the occurrence, frequency and characteristics of intrusions in offspring related to World War Two events experienced by their parents. The frequency and characteristics of intrusions of indirectly experienced events were compared with a) intrusions resulting from personally experienced traumatic events (i.e., as reported on a screening instrument for potentially traumatic events in a respondent's lifetime), and b) intrusions reflecting perceived war-related upbringing. The latter intrusion type was added given that previous studies have indicated that offspring have often mentioned their upbringing as distressing and as strongly influenced by their parent's war experiences (e.g., Scharf

& Mayseless, 2011; Wiseman et al., 2002; Yehuda et al., 1998) while existing screeners for distressing and traumatic life events do not incorporate an explicit category for this type of events. Intrusions reflecting perceived war-related upbringing can be differentiated from the indirect intrusion category because the latter refer to intrusions related to *directly* experienced events in childhood (i.e., whereas the other category refers to intrusions related to events experienced by parents in World War Two).

METHODS

Participants

The study sample consisted of a convenience sample of now-adult first-generation World War Two survivor offspring (*N* = 101) in treatment at one of two Dutch treatment centers specialized in the treatment of war-related mental health problems. The patients were either self-referrals or referred by their general practitioner because of an assumed link between their symptoms and the World War Two experiences of their parents. The participants were recruited between 2011 and 2016. The sample size was determined by feasibility reasons (i.e., data collection was terminated after 5 years). To be included in the study, participants had to meet the following criteria: 1) At least one of the biological parents or caretakers was survivor of the German or Japanese occupation in World War Two; 2) the offspring were born after the liberation (either May 5th, 1945 in the Netherlands or August 15th, 1945 in the Former Dutch East Indies)[2]. Both male and female offspring were included. The exclusion criteria were 1) current (comorbid) diagnosis of schizophrenia and other psychotic disorders, and 2) current alcohol or drug dependence as recorded in their personal file at the treatment center. One patient was born in 1944 and two additional patients were excluded because of current alcohol or drug dependence, rendering a sample of *N* = 98. In this sample, the mean age was 55.64 years (*SD* = 6.92) and 57 % was female. The median education level was 6 (range 2–7) on a scale from 1 (low, primary school) to 7 (high, university) (Verhage, 1964).

The study was approved by the Medical Ethical Committee of the University Medical Centre Groningen. Written informed consent included consent to use participant questionnaire data as well as consent to obtain the participant's main and comorbid psychiatric diagnoses according to DSM-IV classification classified by trained clinical professionals from their personal files at the treatment center.

The mental disorders categorized according to DSM-IV (Diagnostic and Statistical

2 The offspring did not experience World War Two themselves, although in the Former Dutch East Indies a liberation war (1945-1949) took place after the Japanese capitulation.

Manual of Mental Disorders, American Psychiatric Association (APA), 2000) were available from 94 of the 98 patient files (96 %). More specifically two participants provided informed consent for the study but refused to give consent to obtain their diagnostic information and from two personal files, the information on primary diagnosis was missing. In 68 % (*N* = 64) patients were diagnosed with an Axis I disorder as a primary diagnosis, whereas in 31 % (*N* = 29) an Axis II disorder (i.e., personality disorder) was mentioned as the primary diagnosis. For one patient, both an Axis I and Axis II disorder were mentioned as primary diagnosis. The most frequently mentioned primary Axis I disorders were mood disorders (55 %) and anxiety disorders (24 %). Seventeen patients (18 %) were diagnosed with PTSD, of which 10 (11 %) the main diagnosis was PTSD and 7 (7%) PTSD was a co-morbid diagnosis. The most frequently mentioned Axis II disorder was personality disorder not otherwise specified (50 %). Most patients received one or more comorbid diagnosis (49 % Axis I and 61 % Axis II diagnosis). Anxiety disorders and mood disorders were mentioned in almost equal numbers as a comorbid Axis I diagnosis, both about 20 %.) The mean total score on the PSS-SR (PTSD Symptom Scale Self-Report; (Foa et al., 1993) was 21.22 (*SD* = 11.24), on the subscale re-experiencing (5.70 (*SD* = 4.12), on the subscale avoidance 8.30 (*SD* = 4.82), and on the subscale hyperarousal 7.23 (*SD* = 3.42).

Measures

The *Life Events Checklist* (LEC) (Gray et al., 2004; Hovens et al., 2005) is a 17-item self-report measure designed to screen for potentially traumatic events in a respondent's lifetime. The LEC assesses exposure to 16 events known to potentially result in PTSD and includes one additional item to index other extraordinarily stressful events not covered by the first 16 items. For each possible traumatic event, respondents rated their experiences on a 4-point nominal scale (1 = happened to me, 2 = witnessed it, 3 = experienced by a relative, 4 = does not apply). The LEC has demonstrated convergent validity with other measures designed to assess exposure to traumatic events (Gray et al., 2004).

The *Offspring Intrusive Memory Questionnaire* was developed for the purpose of this study, to compare the memory characteristics of different kinds of intrusions, and is based on the Autobiographical Memory Questionnaire by Rubin, Boals, and Berntsen (Rubin, 2008b). A broad definition of intrusive memories was included referring to images and/or thoughts that suddenly and involuntarily pop up in consciousness when awake without the intention to retrieve a memory. The questionnaire consists of three parts each containing comparable items but referring to different types of intrusions. The first part assesses intrusions related to personally experienced traumatic events as indicated in the LEC. The second part assesses indirect intrusions from war events experienced by parents during the German or Japanese occupation in the Second World War. Finally, the third part assesses intrusions related to war-related upbringing.

Each part started by asking to describe the main intrusion related to the traumatic event (i.e., the intrusion occurring most frequently). If participants experienced many intrusions with similar frequency, the most distressing of these was identified as the main intrusion. After describing the intrusion, they were asked to indicate certain characteristics for this intrusion: (a) The frequency (scale from 1 almost never to 7 several times a day), (b) the intensity (scale from 1 not intense not intense at all to 7 very intense) and (c) valence (scale from 1 very negative to 7 very positive) of the feelings, (d) repetitiveness (scale from 1 not at all to 7 as if experiencing again), (e) vividness (scale from 1 not at all to 7 very), (f) perceptual detail (scale from 1 not at all to 7 completely), (g) level of fragmentation (scale from 1 fragments to 7 as a whole), (h) the influence on mood (scale always the same, worse or better mood), (i) physical sensation, (scale from 1 not at all to 7 very strong), (j) controllability (scale from 1 not at all to 7 very), (k) reliving (scale from 1 not at all to 7 completely), (l) from which perspective (first- vs. third person) the intrusive memory was experienced (scale from 1 observer to 7 field), (m) content of the intrusions (i.e., always the same, reflects the start, warning signal, turning point, wish other action, worst moment or worst case scenario (all scales from 1 not at all to 7 completely true), and (l) whether the intrusion was triggered by anything. The final part of the questionnaire consisted of offspring demographic data (e.g., age, education,) and further event and family characteristics (e.g., parental age, war experiences).

The *PTSD Symptom Scale Self-Report* (PSS-SR; (Foa et al., 1993) was included to assess posttraumatic stress symptoms. The scale consists of 17 items consistent with the 17 DSM-IV criteria for PTSD (Engelhard, Arntz, & Van den Hout, 2007). The items are scored on a 4 point-scale (range from 0 = not at all to 3 = five or more times a week/almost always, anchors differing slightly between questions). The total score (range: 0–51) is calculated as the sum of the severity ratings for the 17 items. PTSD cluster severity scores were calculated as the sum of the severity ratings for the items in each of the subscale re-experiencing, avoidance and arousal. The PSS-SR has good psychometric properties (Engelhard et al., 2007). Cronbach's alpha in the current sample was 0.91 for the total scale, 0.87 for the re-experiencing scale, 0.75 for the avoidance scale, and 0.72 hyperarousal scale.

Procedure

The participants completed questionnaires in the following fixed order: (1) Life Events Checklist (LEC); (2) Offspring Intrusive Memory Questionnaire; (3) PTSD Symptom Scale Self-Report (PSS-SR). The participants completed the questionnaires at home. This study was part of a larger investigation in this patient group. Only measurement details relevant to the current study are described in this section.

Statistical methods

Intrusions related to indirect experiences (i.e., parent war-related experiences) were compared to 1) intrusions related to personally experienced or directly witnessed events (i.e., as indicated on the LEC), and 2) intrusions referring to war-related upbringing. Because the types of intrusions are nested within participants (i.e., each participant may report one, two or three types of intrusions), we used multilevel models to analyze the occurrence of memory intrusions and the various intrusion characteristics measured by the Offspring Intrusive Memory Questionnaire. To compare the intrusion types with respect to outcomes measured on an interval measurement level, we used a linear mixed model analysis. For dichotomous outcomes we performed a generalized linear mixed model (a logistic regression with random effects). Throughout the analyses, we used Variance Components as the covariance type for random effects and the standard Restricted Maximum Likelihood (REML) as the model fit estimation method. We utilized an overall significance level of 5%. We report both initial test results as well as results after controlling for the false discovery rate using the Benjamini-Hochberg procedure (Benjamini & Hochberg, 1995). All available data were included. As a consequence, sample sizes across analyses are not completely consistent as some patients did not complete all items in some questionnaires, details are reported in the specific analyses.

RESULTS

All patients (*N* = 98) indicated that their father and/or mother experienced traumatic events in the Second World War, and 58 % reported that they had experienced one or more intrusions related to these events (see Table 1). Ninety-three percent of the patients indicated that they had experienced or directly witnessed one or more personal traumatic events. The most often reported events were physical assault, unwanted sexual experiences other than sexual assault, sudden unexpected death of loved one, and motor vehicle accidents. Of these patients, 66 % indicated that they had experienced one or more intrusive memories related to these events. Ninety-seven percent of the patients indicated that the war and the war experiences of their parents played a role in their upbringing. Of these patients, 71 % reported that they had experienced one or more intrusive memories related to these events. Thirty-seven percent of the patients indicated they had experienced all three types of intrusions.

Table 1
Characteristics of Intrusive Memories per Event Type (Dichotomous Variables).

Measure	Type I Parent trauma	Type II Personal trauma	Type III Upbringing	Comparison	*Odds Ratio*	95 % *CI*	*p*
Occurrence of intrusion	58 %	66 %	71 %	I vs. II	0.72	0.39 – 1.35	*p* = .30
	(*n* = 83)	(*n* = 87)	(*n* = 93)	I vs. III	0.56	0.30 – 1.05	*p* = .07
Always the same (vs different) intrusions?	17 %	29 %	29 %	I vs. II	0.50	0.19 – 1.29	*p* = .15
	(*n* = 47)	(*n* = 59)	(*n* = 65)	I vs. III	0.48	0.19 – 1.24	*p* = .13
Specific trigger?	90 %	96 %	93 %	I vs. II	0.41	0.07 – 2.41	*p* = .32
	(*n* = 41)	(n = 47)	(n = 60)	I vs. III	0.66	0.15 – 2.84	*p* = .58
Worse mood	83 %	80 %	77 %	I vs. II	1.25	0.46 – 3.37	*p* = .67
(compared to better mood or unchanged)	(*n* = 47)	(*n* = 59)	(*n* = 66)	I vs. III	1.43	0.55 – 3.75	*p* = .46
Intrusion reflects:	(*n* = 48)	(*n* = 59)	(*n* = 65)	I vs. II	0.76	0.28 – 2.08	*p* = .59
Start of traumatic event	17 %	20 %	15 %	I vs. III	1.07	0.38 – 3.01	*p* = .90
Warning signal	17 %	37 %	26 %	I vs. II	0.34	0.13 – 0.85	*p* = .02
Turning point good*	2%	5%	0%	I vs. III	0.57	0.22 – 1.45	*p* = .24
Wish other action	10 %	14 %	11 %	I vs. II	0.73	0.22 – 2.43	*p* = .61
				I vs. III	0.95	0.28 – 3.24	*p* = .94
Worst moment	48 %	27 %	34 %	I vs. II	2.47	1.10 – 5.57	*p* = .03
				I vs. III	1.80	0.83 – 3.88	*p* = .13
Worst case scenario:	(*n* = 47)	(*n* = 59)	(*n* = 66)				
Less severe than event	26 %	22 %	15 %	I vs. II	1.21	0.49 – 3.00	*p* = .67
(i.e., compared to more severe or the same)				I vs. III	1.92	0.75 – 4.95	*p* = .18
More severe than event	32 %	31 %	30 %	I vs. II	1.08	0.47 – 2.48	*p* = .86
(i.e., compared to less severe or the same)				I vs. III	1.09	0.48 – 2.47	*p* = .83

Note. * Test results not calculated given the low frequencies reported. The reported *n* in cells refers to the number of valid cases on which the percentages are based.

Table 2
Characteristics of Intrusive Memories per Event Type (Continuous variables).

Measure	Type I Parent trauma *M (SD)*	Type II Personal trauma *M (SD)*	Type III Upbringing *M (SD)*	Comparison	Mean Difference	95 % CI	*p*
Frequency of intrusion	3.40 (1.75)	3.71 (1.82)	3.40 (1.78)	I vs. II	–0.48	–1.04 - 0.09	*p* = .10
(1 almost never - 7 several times a day)	(*n* = 48)	(*n* = 56)	(*n* = 62)	I vs. III	–0.14	–0.69 - 0.40	*p* = .60
Intensity of feelings during the intrusion	5.91 (1.18)	5.86 (1.28)	5.70 (1.34)	I vs. II	0.04	–0.40 - 0.48	*p* = .84
(1 not intense at all – 7 very intense)	(*n* = 47)	(*n* = 59)	(*n* = 66)	I vs. III	0.22	–0.21 - 0.65	*p* = .31
Valence of feelings during the intrusion	2.38 (1.50)	1.78 (0.91)	2.20 (1.49)	I vs. II	0.60	0.10 - 1.09	*p* = .02
(1 very negative - 7 very positive)	(*n* = 48)	(*n* = 59)	(*n* = 66)	I vs. III	0.18	–0.31 - 0.66	*p* = .47
Visual images	6.24 (1.21)	6.00 (1.53)	–	I vs. II	0.14	–0.26 - 0.54	*p* = .49
(1 not at all – 7 completely)	(*n* = 46)	(*n* = 59)					
Thoughts	5.98 (1.65)	5.71 (1.71)	–	I vs. II	0.28	–0.31 - 0.87	*p* = .35
(1 not at all – 7 completely)	(*n* = 46)	(*n* = 58)					
Sounds	3.86 (2.43)	3.86 (2.47)	–	I vs. II	0.06	–0.71 - 0.82	*p* = .88
(1 not at all – 7 completely)	(*n* = 42)	(*n* = 57)					
Smells	2.44 (2.05)	2.15 (1.88)	–	I vs. II	0.29	–0.17 - 0.76	*p* = .22
(1 not at all – 7 completely)	(*n* = 43)	(*n* = 55)					

Table 2 *Continued.*

Measure	Type I Parent trauma *M (SD)*	Type II Personal *trauma M (SD)*	Type III Upbringing *M (SD)*	Comparison	Mean Difference	95 % *CI*	*p*
How vivid – clear is the memory	5.60 (1.71)	5.95 (1.57)	5.85 (1.64)	I vs. II	–.40	–0.88 - 0.09	*p* = .11
(1 not at all – 7 very)	(*n* = 48)	(*n* = 59)	(*n* = 66)	I vs. III	–.29	–0.76 - 0.17	*p* = .21
Physical sensation during the intrusion	5.60 (1.35)	5.69 (1.37)	5.74 (1.29)	I vs. II	–.11	–0.54 - 0.32	*p* = .62
(1 not at all – 7 very strong)	(*n* = 48)	(*n* = 59)	(*n* = 65)	I vs. III	–.15	–0.57 - 0.27	*p* = .48
Controllability of the intrusion	3.38 (1.95)	2.98 (1.79)	3.33 (2.00)	I vs. II	.45	–0.10 – 1.00	*p* = .11
(1 not at all – 7 very)	(*n* = 47)	(*n* = 59)	(*n* = 66)	I vs. III	.12	–0.41 - 0.64	*p* = .67
Field vs. observer perspective	5.27 (2.14)	5.15 (2.30)	5.12 (2.22)	I vs. II	.07	–0.75 - 0.90	*p* = .86
(1 observer – 7 field)	(*n* = 48)	(*n* = 59)	(*n* = 66)	I vs. III	.11	–0.69 - 0.91	*p* = .79
Reliving	5.10 (1.53)	5.39 (1.57)	5.24 (1.58)	I vs. II	–.38	–0.90 - 0.13	*p* = .14
(1 not at all – 7 completely)	(*n* = 48)	(*n* = 59)	(*n* = 66)	I vs. III	–.25	–0.75 - 0.24	*p* = .31
Fragmentation	4.04 (2.05)	4.37 (2.10)	4.62 (2.17)	I vs. II	–.33	–1.00 - 0.35	*p* = .34
(1 fragments –7 as a whole)	(*n* = 48)	(*n* = 59)	(*n* = 66)	I vs. III	–.62	–1.27 - 0.03	*p* = .06
Event really happened	5.35 (2.03)	6.46 (1.21)	6.14 (1.59)	I vs. II	–1.11	–1.63 - -0.59	*p* < .001
(1 completely made up – 7 completely true)	(*n* = 48)	(*n* = 59)	(*n* = 65)	I vs. III	–.85	–1.36 - -0.35	*p* = .001

Note. The reported *n* in cells refers to the number of valid cases on which the percentages are based.

The results of the linear mixed model analyses indicated no differences in the reported frequency of intrusions when comparing indirect intrusions (i.e., based on war experiences of parents) with personally experienced traumatic events nor when comparing them to intrusions related to upbringing events. The means and standard deviations on the reported various other intrusion characteristics for the three types are summarized in Table 1 (dichotomous variables) and Table 2 (continuous variables)[3]. Considering indirect intrusions (i.e., related to parent war trauma), the majority of participants experienced multiple intrusions (i.e., in contrast to the same intrusion over and over again, 17%). The mean frequency of the reported intrusions was between multiple times per month and once a week. Almost everyone (90 %) experienced triggers that elicited the intrusions. The mean intensity of the reported feelings during intrusions was rated by the participants as intense and most participants (83 %) reported a worsened mood following the intrusion. Participants indicated that they experienced indirect intrusions often in the form of visual images and thoughts (i.e., as compared to intrusions in the form of sounds and smells)[4]. Participants also rated the intrusions as quite vivid. Physical reactions during the intrusions (e.g., sweating, cramps, cardiac palpitation) were rated as quite strong. Regarding the vantage point of the intrusions,

3 Three additional items were not analyzed. One item pertained to the number of different intrusions. This item was not analyzed as the scores were difficult to categorize as they were very heterogeneous (e.g., answered in words or numbers). The same accounts for an item asking to describe the type of cue eliciting the intrusion. The third item asked about the moment of day of the intrusion. This item was not analyzed because the vast majority of participants indicated there was not a fixed moment when the intrusion occurred.

4 Due to a technical error, the scale administered in Type III was incorrect, so these results are not reported.

the participants indicated that they experienced the intrusions more from a field (i.e., first-person) perspective than from an observer (i.e., third-person) perspective. They also indicated that the feeling of reliving of the experience during the intrusion was quite high.

On fragmentation and controllability of the intrusion, participants did not show clear scores towards the fragmentation or coherence end. No significant differences were found when comparing the characteristics mentioned above for intrusions related to the parent war experiences compared to intrusions related to personal trauma nor when comparing them to intrusions related to upbringing. Significant differences between indirect intrusions compared to the other two types of intrusions were found for a few other reported characteristics. One of these was the valence of the emotions felt during the intrusions. Participants indicated that intrusions related to the parent's war experiences were experienced as less negative compared to events related to personal events (mean difference 0.60 on a scale from 1 to 7). In addition, in response to the question whether the event in the intrusion really happened (i.e., whether nothing was imagined or added that did not happen), participants considered the events in their intrusions related to their parent's war experiences as relatively more 'made-up' while they considered the events in their intrusions related to personal events and those related to their upbringing to have happened more in reality (mean difference 1.11 on a scale from 1 to 7). Finally, a higher percentage of participants indicated that the intrusions related to their parents' war experiences reflected the worst moment of the event (odds ratio 2.47) while the intrusions related to their personally experienced traumatic events more often reflected the warning signal (i.e., referring to the moment when they realized the severity of the situation, in other words, the traumatic turning-point; odds ratio 0.34).

After correction for the false discovery rate using the Benjamini- Hochberg procedure (Benjamini & Hochberg, 1995; 44 comparisons in total), only two comparisons remained significant. That is, participants indicated that the events related to the indirect intrusions were experienced more as made up (i.e., less as if it really happened) compared to personally experienced traumatic events and compared to events related to upbringing.

DISCUSSION

The aim of the present study was to systematically investigate the occurrence and characteristics of intrusions in offspring related to events that happened to their parents several decades ago and thus were not directly experienced or witnessed. Importantly and in line with the mnemonic model, we found that intrusions related to indirectly experienced events, that is, war atrocities experienced by the offspring

parents in World War Two, were indeed reported. We thus found evidence for the occurrence of intrusions referring to indirectly experienced traumatic events. The frequency of these intrusions did not differ from the frequency of intrusions about directly experienced traumatic events or war-related upbringing.

The intrusions related to indirectly experienced events were comparable to both types of intrusions of directly experienced (traumatic) events. They were all experienced as vivid, intense, and uncontrollable, mainly in the form of images and thoughts, and they were accompanied by relatively strong physical sensations. It should be mentioned that after applying the Benjamini-Hochberg procedure for controlling familywise error, none of the differences in characteristics between the intrusion related to indirectly experienced events and the two other types of intrusions remained significant but one: the question whether the event in the intrusion really happened. Participants indicated that they felt that intrusions referring to indirectly experienced events relatively were more fabricated compared to intrusions referring to personally experienced traumatic events and events related to upbringing; those latter ones were experienced relatively more as completely true and real.

The similarity between direct and indirect intrusions with regard to their frequency and other characteristics provide support for the mnemonic model with its emphasis on the (re)constructive nature of memory, its accentuation of comparable memory processes for non-traumatic (but emotional) and traumatic memories, and its emphasis on the possibility of indirect memories being constructed and reconstructed at a later point in time. Because memory (re)construction may well be influenced by current psychopathology, current goals, and individual characteristics such as neuroticism (Rubin et al., 2008b), it would be interesting for future research to examine if these variables may also be related to the occurrence and characteristics of indirect intrusions. We would like to emphasize, however, that although the current finding (i.e., also indirectly experienced events may give rise to intrusions) cannot be readily explained by 'special mechanisms' models, this by no means discredits the relevance of these models for understanding the development of intrusions related to directly experienced traumatic events.

Another interesting finding was that intrusions related to upbringing were also quite frequent and influential in this sample of survivor offspring. We chose to assess intrusions related to upbringing as a separate category following the results of previous studies (e.g., Yehuda et al., 1998), reporting that around one-fourth of the offspring mentioned Holocaust-related upbringing as their most distressing life event. The results of our current study indicate that upbringing not only plays an important role in voluntary retrieval but also in the involuntary memory of these patients. The experience of frequent intrusive memories of upbringing related topics is not only rated as eliciting negative and intense feelings during the intrusion, but also to have a detrimental impact on functioning in daily life.

Given the exploratory nature of the current study, we included many variables and corrected for multiple testing. Before applying the Benjamini-Hochberg correction, some notable differences between the types of intrusions were found that may be worth of further scrutiny in future research. First, the current findings point to the possibility that intrusions related to parents' war experiences were perceived more often as reflecting the worst moment of the event, while the intrusions related to personally experienced traumatic events consisted of a warning signal (i.e., referring to the moment when they realized the severity of the situation, in other words, the traumatic turning-point). These warning signal intrusions represented stimuli that were present shortly before the moment with the largest emotional impact and they indicated impending danger (Ehlers et al., 2002). Further research may extend this finding and investigate, for example, the possibly differential impact of worst moment vs. signal intrusions on people's mood and other features of mental disorders. Another interesting avenue for further research of intrusions in offspring might be whether the intrusions mainly relate to offspring witnessing their parent(s) relive WWII experiences or whether they were told or found out in different ways the details of these experiences.

Limitations of the current study include the explorative nature of the study resulting in many comparisons and the retrospective nature. This calls for replications using other methods (e.g., experience sampling methods in a specified monitoring period) and hypothesis-driven replication in independent samples. The current study also provides an indication which variables to consider in future studies such as the type of content of the intrusions (i.e., whether it reflects the worst moment or a warning signal). Also, asking people directly about intrusive memories may overestimate the prevalence of such memories, but this then was the case for all types of intrusions in the current study because all three kinds of intrusions were directly asked about in the same way. Furthermore, the results of the current patient sample may not be generalizable to the population of (children of) the wider field of man-made or natural traumatic incidences or even (adult) children of war/ Holocaust survivors in general because it consisted of a patient sample in treatment at a center specialized for war-related problems. This selection of participants may have resulted in increased reports of intrusions related to parent experiences. Moreover, it should be acknowledged that the type of treatment that was offered to the patients was not monitored in this study. It can thus not be ruled out that some patients may have received trauma-focused therapy, which might have influenced (i.e., diminished) the occurrence, frequency and quality of reported direct intrusions (i.e., related to personally experienced events). It would be interesting to see whether similar intrusions can also be found in World War Two offspring not in treatment and in other groups of individuals who indirectly experienced different types of negative events. However, the aim of the current study was to investigate whether indirect intrusions, that is, intrusions experienced by the

family, friends, and/or colleagues of those involved by way of indirect exposure to the traumatic event, occur at all. Our results clearly show that this is the case in offspring of World War Two survivors. It would be interesting to see whether similar intrusions can also be found in World War Two offspring not in treatment and in other groups of individuals who indirectly experienced different types of negative events.

The occurrence of indirect intrusions raises the question if and in what way these intrusions need psychological treatment. Available evidence-based interventions for intrusions referring to direct traumatic experiences (e.g., EMDR, prolonged exposure, or imagery rescripting) might also be effective for the treatment of intrusions referring to indirect traumatic experiences. On the other hand, these methods might have (more) negative side effects when applied to intrusions referring to indirect experiences. This includes the risk of the creation of false memories (e.g., Houben, Otgaar, Roelofs, Smeets, & Merckelbach, 2020). Patients may, for example, start to experience the events as having happened to themselves instead of to their parent as a result of adding vivid self-referential memory details in reconstructing the scene of the memory. Therapists should be very careful in the treatment of indirect intrusions. It will be important to provide psychoeducation on the (re)constructive nature of memory, therapists should avoid labelling intrusive images as memories, and avoid asking patients to reconstruct in detail and/or in a self-referential nature.

Taken together, the current findings demonstrate that traumatic events may not only afflict those directly involved but may also have repercussions on their offspring. Not only do these events have a direct impact on the upbringing and attachment relation perceived in the next generation, they also give rise to intrusions in trauma survivor's offspring, with comparable characteristics to intrusions related to personally experienced event. Traumatic events thus have an indirect impact on the mental health of the next generation and possibly many generations to come.

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CHAPTER 4

Indirect Intrusions about World War Two in Survivor Offspring: A Qualitative Thematic Content Analysis

Based on:
Dashorst, P., Mooren, T.M., Donath, W., Blonk, A., Kleber, R.J., de Jong, P.J., & Huntjens, R.J.C. (2023). Indirect Intrusions about World War Two: A Qualitative Thematic Content Analysis [Manuscript in preparation].

ABSTRACT

Background

A substantial proportion of World War Two survivor offspring reports intrusions about a war they have not experienced themselves. Knowledge about the content of these intrusions may provide an in-depth understanding of the themes impacting the mental health of offspring and the intergenerational consequences of parental traumatic World War Two events. Therefore, this study used a qualitative approach to examine the core themes of indirect intrusions reported by survivor offspring.

Methods

Participants (N = 41) were post-war-born offspring of World War Two survivors. They were in treatment in one of two national clinics specialized in the treatment of war victims. We conducted an inductive thematic analysis of the written descriptions of indirect intrusions reported in the offspring sample and related to World War Two survivor experiences.

Results

The analysis indicated the following themes: cruelty, sensory perceptions, emotions, and perspective (first or third person).

Conclusions

Offspring mostly described intrusions about World War Two as visual cruel images from a first-person perspective, provoking distress and other strong emotions. Indirect intrusions may signify intergenerational consequences of parental traumatic events. Therefore, special attention is needed to the presence and content of indirect intrusions among offspring of survivors of wars or other traumatic events.

INTRODUCTION

Recurring involuntary memories of traumatic events are an important feature of posttraumatic stress disorder (PTSD) (DSM-5; American Psychiatric Association, 2013). Individuals frequently experience these memories as very intrusive and vivid, causing intense feelings of personal distress (Ehlers & Clark, 2000; Ehlers et al., 2004; Rubin et al., 2008a, 2008b, 2011; Steel & Holmes, 2008). Involuntary memories are most often experienced as visual images, although other modalities have also been reported (Birrer et al., 2007; Ehlers & Steil, 1995), and are accompanied by a persistent sense of 'nowness' (Ehlers & Clark, 2000; Hackmann et al., 2004). Most previous research has focused on *direct* intrusions, that is intrusions referring to self-experienced or directly witnessed traumatic events (e.g., Hackmann et al., 2004; Holmes et al., 2005). However, empirical research indicated that, for example, individuals whose family members have been murdered (Rynearson & McCreery, 1993) or whose relatives were hospitalized due to burn injuries (Celia et al., 1988) also reported occurrences of intrusions despite not having experienced the traumatic event themselves. These *indirect intrusions*, that is, intrusive thoughts or memories following indirect exposure to traumatic events, have not been frequently studied. Yet, this type of intrusion seems prevalent among World War Two survivor offspring (e.g., Wiseman, 2008; Yehuda et al., 1998).

One of the few studies that systematically examined indirect intrusions in World War Two survivor offspring demonstrated that both the frequency and memory characteristics of indirect and direct intrusions are comparable, although participants rated indirect intrusions as feeling relatively more fabricated compared to direct intrusions (Dashorst et al., 2020). Another study found that some Holocaust survivor offspring described moments of experiencing their parents' traumatic events themselves (Braga et al., 2012). Little is known, however, about the actual content of indirect intrusions reported by offspring.

THE PRESENT STUDY

The goal of the current study was, therefore, to more systematically examine the *content* of indirect intrusions of World War Two survivor offspring. We used qualitative methods (inductive thematic analysis) to identify the core themes that were prominent in offspring's (indirect) intrusions associated with World War Two scenes, as such approach seems most fitted for exploring the "how" and "what" aspects of intrusions (Binder et al., 2012; Braun & Clarke, 2006). Such qualitative analyses may reveal unique and yet unreported characteristics of indirect intrusions, thus providing welcome complementary information to (quantitative) findings about the frequency and characteristics of this type of intrusions (e.g., Dashorst et al., 2020, 2022). Knowledge

of the content of indirect intrusions may provide more in-depth understanding of the themes impacting offspring.

METHODS

Participants

This study is part of a larger project on intrusions of World War Two survivor offspring (for more details about the project see Dashorst et al., 2020, 2022). The current study included adult World War Two survivor offspring in treatment at one of two Dutch centers specialized in war-related mental health problems (*N* = 98). The inclusion criteria were: 1) At least one of the biological parents or caretakers was a survivor of the German or Japanese occupation during World War Two; 2) Participants were born after the liberation (either May 5th, 1945, in the Netherlands or August 15th, 1945, in the Former Dutch East Indies)[5]. Exclusion criteria were: 1) Current (comorbid) diagnosis of schizophrenia and other psychotic disorders, and 2) Current alcohol or drug dependence as recorded in their personal file at the treatment center. For the current analyses, we included the sub-sample (*n* = 48) of participants who reported having intrusions referring to World War Two events experienced by their parents.

The study was approved by the Medical Ethical Committee of the University Medical Centre Groningen. Written informed consent entailed permission to use participant research data as well as consent to obtain the participant's main and comorbid psychiatric diagnoses according to DSM-IV classification (DSM IV; American Psychiatric Association, 2000) classified by trained clinical professionals from their personal file at the treatment entre. The primary diagnosis included Axis I mood (*n* = 23) and anxiety disorders (*n* = 15) (i.e., PTSD included), and Axis II personality disorder not otherwise specified (*n* = 11). Most patients received one or more comorbid diagnoses (60% Axis I and 30% Axis II diagnosis). Seven patients were diagnosed with PTSD as a primary diagnosis and four with a comorbid PTSD diagnosis.

Materials

We used the qualitative part of *The Offspring Intrusive Memory Instrument.* A broad definition of intrusive memories was used: Images and/or thoughts that suddenly and involuntarily come into consciousness when awake. For a full description of the instrument see Dashorst et al. (2020). For the current study, the qualitative analysis was restricted to items referring to indirect intrusions about World War Two events experienced by their parents. All participants who confirmed to have indirect intrusions were asked to provide a written description of their most frequently occurring and/or most distressing intrusion. Specifically, we instructed the participants as follows:

> Please try to think back of the most frequently occurring / most distressing intrusion[6] that you have had as a result of the experiences of your parents. Please describe the intrusion below (Note, for example: What was the intrusion about? Where did it take place? What happened? Who was involved? etc.). You do not need to worry about making potential language or spelling mistakes.

Together with the offspring's demographic information (e.g., age, gender, education), participants were asked about the sources of information concerning their parental war experiences (i.e., by whom and in what manner they received information).

Data analysis

For this study, we employed a qualitative thematic analysis of the narrative part of the questionnaire (Braun & Clarke, 2006). We followed the APA reporting standards for qualitative research in psychology (Levitt et al., 2018). The participants' hand-written description of an intrusion was transcribed into a digital word format and imported into Excel and MAXQDA10 (VERBI Software, 2019). Two assessors familiarized themselves with the patients' descriptions (WD & AB). The assessors independently first selected text fragments (words, a part of a sentence, or a whole sentence) with a coherent meaning. Only fragments describing the intrusion content were analyzed[7] (*n* = 41). The assessors individually and inductively coded each fragment and an initial code list was established. The content of a selected text fragment could have more than one meaning; therefore, more than one code could be assigned to a fragment. The two assessors discussed their disagreements in coding and remaining disagreements were resolved with a third assessor (PD) until full agreement was reached. Based on these discussions, a final codebook of 111 codes was established.

In the final phase, the first author axially coded and organized the initial 111 codes into four main themes: (1) themes describing cruelty, (2) sensory themes, (3) emotional experiences, and (4) participant's perspective (first or third person). The themes were discussed with the two initial assessors (WD and AB) and TM until complete agreement was reached.

5 The offspring did not experience World War Two themselves, although in the Former Dutch East Indies a liberation war (1945-1949) took place after the Japanese capitulation.

6 A broad definition of intrusive memories was included referring to images and/or thoughts that suddenly and involuntarily pop up in consciousness when awake without the intention to retrieve a memory.

7 Text fragments related to the following sources of information were not analysed: 1) the original source of information associated with the content of the intrusion e.g. storytelling, audiovisual information; 2) triggers activating the intrusive thoughts or memories; 3) emotional reactions provoked by the intrusion and 4) miscellaneous information containing descriptions of e.g., historical background information, family history, or other content not related to intrusion content.

RESULTS

The participants' mean age was 56.42 years (*SD* = 6.19), and 60% was female. The median education level was a bachelor's degree, ranging from primary school to university. When asked whether the war was discussed at home when they were young, most participants indicated that the war was not talked about much (49%) or only from time to time (27%). In some families, it was never discussed (7%), whereas, in others, it was discussed frequently (17%) (Table 1). Three-quarters of the participants indicated that they received information from their parents directly. Half of them indicated that they received information only from their parents, and the other half combined it with information from other individuals, mostly family members (e.g., grandparents, aunts, uncles), or audiovisual sources such as books, television, and movies. A minority of the participants actively searched for information by themselves (22%) or reported that they did not use a specific source to build a representation of what their parents had gone through (7%). About 40% of the participants indicated that their parents spoke in veiled terms about their experiences in the war (fathers 43%, mothers 35%). In contrast, about 30% indicated that their parents spoke very frankly about their experiences (fathers 23%, mothers 33%). Almost half of the participants reported that their parents mainly gave factual information about what had happened. A quarter indicated their parents spoke about details such as what they saw, heard, or smelled. Also, a quarter of participants indicated that their parents had told them how the war events had affected their feelings and thoughts.

Table 1
How did participants acquire information about the war (*N* = 41)

	n	(%)
What information source(s) did you use primarily about your parents' experiences during the war?		
Stories told by their parents	30	(75)
Stories told by other individuals	8	(20)
Audiovisual sources (e.g., television or movie)	5	(12)
No specific source	3	(7)
Actively searched for information themselves	9	(22)
Other	1	(<1)
Was the war discussed at home when you were young?[1]		
Not at all	3	(7)
Very little	20	(49)
From time to time	11	(27)
Very much	7	(17)
In what manner did your father (*n* = 37) used to talk about the war?[2]		
Veiled terms	16	(43)
Not in veiled terms nor very frankly	9	(24)
Very frankly	11	(23)
In what manner did your mother (*n* = 40) used to talk about the war?[2]		
Veiled terms	14	(35)
Not in veiled terms nor very frankly	13	(33)
Very frankly	13	(33)
When your parents or others told you about the war, in what matter did they talk about it?		
With many details of what they had observed, such as what was seen, heard, and smelled	9	(22)
Much factual information about what had happened	21	(51)
They mainly talked about the effect the war had on their feelings and thoughts.	12	(29)
Other	6	(15)

Table 1 *Continued.*

	n	(%)
Very frankly	13	(33)
When your parents or others told you about the war, in what matter did they talk about it?		
With many details of what they had observed, such as what was seen, heard, and smelled	9	(22)
Much factual information about what had happened	21	(51)
They mainly talked about the effect the war had on their feelings and thoughts.	12	(29)
Other	6	(15)

Table 2
Results thematic analysis: (sub)themes and endorsement by participants (*N* = 41).

Theme	*n*	(%)	Subtheme	*n*	(%)
Cruelty					
War	41		Camp scenes, imprisonment, forced labour	29	(71)
			Raid, proscecution	7	(17)
			Transportation, deportation	6	(15)
			Shooting, bombing	9	(22)
			Resistance army	6	(15)
			Flee, Escape	14	(34)
			Hiding	9	(22)
Separation from loved ones	10	(24)	Separation from and looking for family	10	(24)
Confrontation with death	29	(71)	Death, dying people, corpses	29	(71)
Violence	27	(66)	Torture	11	(27)
			Punishment	6	(15)
			Physical and/or emotional violence	15	(37)
			Humiliation	4	(10)
Deprivation	14	(34)	Illness, wounds, hunger, or starvation	14	(34)
Sensory perceptions					
	22	(54)	Visual	22	(54)
			Auditory	2	(5)
			Smell	1	(2)
Emotions					
	29	(70)	Fear, panic, danger	20	(49)
			Vulnerability, powerlessness	15	(37)
			Loss	2	(5)
			Mistrust, betrayal	3	(7)
			Anger, hatred, distress	7	(17)
			Shame	2	(5)
Perspective[1]					
			First person (field) perspective	16	(39)
			Third person (observer) perspective	8	(20)
			Identification with the parent (i.e., feeling as if you are the parent)	3	(7)

Note. [1] Reflection of the particpants perspective in the intrusion

Table 2 presents the results of the thematic analysis. Four main themes, their subthemes, and the number of participants reporting each theme (i.e., regardless of the number of times the same theme was mentioned in one narrative) are displayed. Below, we provide a general description of each (sub)theme and example quotes to

illustrate the different (sub)themes. We translated the example quotes from Dutch to English. We have indicated when we excluded parts of the original text. The text in parentheses was not part of the original quotation but was added by the authors to make the excerpt more comprehensible.

Cruelty

The participants reported descriptions of World War Two-associated *war scenes*, *separation* of loved ones, confrontation with *death*, specific kinds of physical and emotional *violence, humiliation, torture,* and *deprivation*. Often their family members, mostly parents and grandparents, were part of the scenes described.

War scenes specific to World War Two were described by three-quarters of the participants. The offspring of survivors of the *German occupation* reported scenes in which people had to flee and parents had to go into hiding to avoid arrest by the Germans during a raid or house search. Also, images of deportation with days of traveling in cattle cars to Nazi concentration camps were described. The arrival at the concentration camp and the determination of those who could work versus those who could not work were described, as well as the separation of men from women, and parents from their children. Also, the inhumane circumstances in which one had to live, with heavy work and lack of food, were pictured. Further, they wrote about images of prisoners in shabby clothes or striped suits without shoes, and scenes in the gas chambers with naked bodies and piles of corpses. They reported intrusions about bombing, shooting, and scenes of the resistance movement. Some participants reported one of these scenes, others reported more than one scene.

> [I see] the flight and hiding of my mother and grandfather then [I hear] SS men are banging on the door and shouting: 'Aufmachen' and 'Wo sind hier die Juden'. They [the Jews] have to go out into the streets, guarded by the Germans and their aggressive sheepdogs. [Then I see the Jews] locked up in the cattle car [for deportation] to Auschwitz. [I see the] life in camp barracks. [Then starts] the selections in Auschwitz (left = death, right = alive). [Thereafter] the gas chamber. [And at last] the many corpses. Throwing living babies into the fire ...I also have the intrusion of fleeing from the concentration camp and the fear of getting caught again. (Man, 62 years).

The offspring of survivors of the *Japanese occupation* reported intrusions about the Japanese internment camps consisting of images of crowded camps where their grandmothers were interned with their young children. They further described images of their grandfathers and young adult fathers interned in men's camps in the Dutch East Indies or Southeast Asia. They also reported pictures of their hungry and malnourished (grand)parents, who were too weak to do heavy work, guarded by Japanese soldiers. Also, scenes about maltreatment and roll calls were mentioned where internees, children included, had to stand in line for hours when the sun was burning heavily.

> ...I see my father ankle-deep in mud on the Burma Railway with snakes and scorpions all around him, no medical care, no shoes, no glasses... (Woman, 49 years).
> I see my mother walking with a wheelbarrow with corpses in Sumatra. A Japanese soldier with a rifle walks next to her. My mother has to bury the bodies, but she is very weak. (Woman, 61 years).

Separation

Participants described scenes with family members being separated from each other. They wrote about images of loved ones who left without saying goodbye or never returned. They also reported images of parents who were afraid their children would get lost. For example, a grandmother is constantly calling out her daughter's name out of fear of losing her.

> ...My father, 17 years old, at the station to Bandung, saying goodbye to his parents, he would never see them again. I see him hanging out the train window and waving... (Man, 59 years).

Confrontation with death was present in many intrusions of scenes of death or dying people. Death or dying is often intentional by murder, shooting, bombing, or maltreatment. In other scenes, the camp infirmary was described as having no or insufficient treatment facilities resulting in people's death.

> My grandmother worked in a morgue in the camp... I see her standing among dozens of dead people... (Man, 46 years).

Violence

Besides the general circumstances of war, specific kinds of physical and emotional violence, and humiliation were mentioned by many of the participants. They wrote about images in which people were punished and humiliated, for example, internees who had to stand for hours on roll call and who had to bow on command by the Japanese guards. Also, intrusions of torture were reported, for instance, prisoners being hanged with their toes just touching the ground. Participants also described images of prisoners that were forced to continue to work despite their exhaustion. Others wrote about intrusions in which physical or sexual abuse was pictured; for

example, the image of grandmother coming back with blood on her body after she was taken away and violated.

> … My father was in a very humiliating and horrible situation: Because of an incident he was buried alive, only his head was sticking out of the ground and the guard urinated over his head. It was very humiliating… (Man, 63 years).
> … My grandmother was ill and her children were malnourished. The prisoners were punished because something had happened. The Japanese forced them to dig a large pit. All the food was thrown in and covered with soil. My father, as a child, had to watch it … (Woman, 51 years).

Deprivation refers to the absence of food, clothing, hygiene, and medical care. Participants described this with images of ill, exhausted, malnourished, and almost skeletal people.

> Every day I see my very skinny, skeletal grandfather… He is in prison and is treated badly, he feels ashamed. I am a little child and can't do anything to help him … (Woman, 57 years).

Sensory perceptions

More than half of the participants reported sensory details. *Visual details* were described the most and were expressed in phrases like "I saw", "it was an image", or "it seemed it was a movie".

> … I have several images. I saw an image of children in the gas chambers, an image of people in cattle trucks. Images of Jews were collected from the Hollandsche Schouwburg [Dutch theater in Amsterdam, used as transit internment camp] and the Jewish nursery and the realization of imminent danger… They were random people, often children. They were defenseless … I regularly experience the images as a film … (Man, 60 years).

A few reported *auditory details, for example,* hearing voices that displayed intense emotions of the actors in the scene. Only one participant, a man of 46 years, reported perceiving a *smell* of a 'kind of musty camp smell' in his intrusion.

Emotions

More than two-thirds of the participants described emotions as part of their intrusions. Most reported the emotions of the actors in the scene.

Fear or words associated with the expression of fear, such as 'panic', 'anxiousness', 'danger', 'tension', or 'distress' were most frequently mentioned.

> … I see images of "policemen" at the tunnel arresting people. I feel my father's panic… (Woman, 56 years).

Vulnerability was mentioned in almost half of the narratives, for example, described with the words 'terrified', 'unsafe', 'desperate', or 'helpless'. Feelings of loss, mistrust, anger, and shame were reported by a minority.

> My intrusion is about my mother and grandmother in the Japanese camp. She [my mother] was about 6 years old. One day, some Japanese beated and kicked my grandmother in front of my mother … It is terrible [for the little child] to see her mother beaten up and not able to do anything. I thought: how lonely, lost, powerless, and unprotected my mother must have felt … I kept seeing that little helpless girl [my mother] and I felt just as helpless as my mother … (Woman, 60 years).

Perspective

Most of the participants used a *field (i.e., first-person) perspective* in their intrusion descriptions, whereas only a few participants employed an *observer (i.e., third-person) perspective*. Sometimes both perspectives were used in one intrusion description. A field perspective was indicated by phrases such as 'I walk', 'I was there', 'I saw it', 'I see … and feel…'.

> I walk in the campgrounds. A guard approaches me with a large, aggressive dog. I get very angry and when the dog wants to attack I literally and figuratively tear it [the dog] to pieces. (Man, 54 years).

An observer perspective was indicated by phrases such as "I see myself" or "I am standing there".

> … Just suddenly, I see myself riding a bicycle, working as a resistance woman/girl … (Woman, 68 years).
> My father, 14 years old, was deported with his favorite sister, uncles, aunts, cousins, and friends. First to the Hollandsche Schouwburg [Dutch Theater in Amsterdam] where he was separated from his family… Then my father's family was deported to what later turned out to be Auschwitz … I was there too! Also, when my father had to flee, had to live in ditches, and had to go into hiding, I was there… (Man, 58 years).

4

A few participants reported they felt ***identification with their parents*** at the scene. They described their intrusions as if they experienced their parental war event themselves; they felt as if they were their mother or father.

> I have an image of a raid and checking the railway. I see images of "policemen" at the tunnel arresting people. I feel my father's panic and realize that I know what to do now: put my bike on my back and climb over the track. I have to flee … (Woman, 56 years).
> … I kept seeing my mother, that little girl, who was my mother, helpless in the Japanese camp. And, at the same time, I was also my mother and as hopeless … (Woman, 62 years).

DISCUSSION

We conducted a qualitative thematic analysis to learn more about the content of indirect intrusions reported in a clinical sample of World War Two survivor offspring. Some participants reported that the war was discussed by their parents in veiled terms, whereas others indicated they spoke about their experiences very frankly. In addition to obtaining information about the war from their parents, participants also received information through stories told by other individuals or audiovisual sources. Some participants actively acquired information; others had a more passive way of taking in this information. The results of the qualitative thematic analysis indicated that the content of the intrusions referred to cruel themes, including war scenes, humiliation, separation of family members, confrontation with death, violence, and deprivation. Furthermore, the intrusions included mostly visual representations and referred to emotional experiences, most often fear, anxiety, and vulnerability of the actors. They were, for the most part, narrated from a first-person viewpoint.

Previous studies have indicated that direct intrusions (i.e., intrusions related to self-experienced traumatic events) often refer to a 'warning signal', the part of the event which precedes the most frightening or dangerous part of the event (with the latter also called the 'hotspot'; Ehlers et al., 2002, 2004; Holmes et al., 2005). In addition, people may also report intrusions that reflect a 'flash-forward' of the traumatic event, referring to the expected ending of the event. For example, people who survived suicide may report intrusive thoughts such as "what would have happened if the suicide attempt had succeeded" (Holmes et al., 2007). In the current study, the reported indirect intrusions typically referred to the worst moment of an event and virtually never contained warning signals or flashforwards. The participants did not use words that represented a future event, such as "what would happen if…". . Instead, they formulated the content of the intrusions in the present tense or past tense. Therefore, we assume these indirect intrusions do not reflect flash-forwards. An explanation of the absence of warning signals might be that because the offspring had not experienced the traumatic events themselves, they did not encode a complete story of that event nor a prelude to the worst moment. Instead, they created a mental image of the event post-hoc.

The scenes of the indirect intrusions were described with visual details and rarely with details of sound or smell. The dominance of visual representations in descriptions of intrusions have also been described in intrusive memories in PTSD referring to self-experienced traumatic events and intrusions associated with their suicide attempts (Ehlers et al., 2002; Holmes et al., 2007). Ehlers et al. (2002) explained the predominance of visual representations in intrusions by an evolutionary process in humans. That is, the visual system is far more developed than other senses like hearing or smelling because visual predominance supports anticipating danger and contributes to warning against impending danger approaching from a large distance. This proposed functional preference for visual representations in direct intrusions may have generalized to indirect intrusions generated by mental imagery.

The intrusions included descriptions of the emotional distress of the actors in the scenes. They mostly referred to fear, anxiety, and a sense of vulnerability, whereas feelings of loss, mistrust, anger, and shame were reported less. The emotions described in these indirect intrusions, especially fear, seem comparable to those described in direct intrusions in PTSD (Ehlers et al., 2002, 2004; Holmes et al., 2005). Further, the indirect intrusions were mainly described from a field (first-person) perspective. Only a few participants used an observer (third-person) perspective to describe their indirect intrusions. This result is in contrast to the results of studies on self-experienced traumatic events, which indicated that direct intrusions are mainly described from the observer perspective regardless of whether PTSD is present or not (Berntsen & Nielsen, 2021). Interestingly, several studies also found that the field perspective was more associated with emotions than the observer perspective (Berntsen et al., 2003; Mooren et al., 2019). A special form of a first-person perspective in the current study were intrusions that described identification with a parent. That is, some participants said they felt like they were experiencing their parents' traumatic events themselves. This form of identification was also previously described in a qualitative study of a sample of Brazilian Holocaust survivor offspring (Braga et al., 2012).

Strengths and limitations

One of the merits of this study is that we asked the participants to focus on an intrusion related to parental World War Two events in an unstructured, open-ended question. The participants entirely determined the details of the written descriptions, and they described them in their own words. This questioning has an advantage over a semi-structured interview. That is, important information could have been missed by

a more closed-ended questioning, such as a semi-structured interview. The bottom-up qualitative analysis of the texts provides a unique insight into the themes of these indirect intrusions.

Nevertheless, this study also has some limitations. The participants were recruited from two Dutch centers specialized in the treatment of war-related mental health problems. Consequently, a selection bias may have been present. Future studies may investigate the role of current mental health problems, including disorders associated with direct intrusions (i.e., PTSD, anxiety, depression; Brewin et al., 2010) in the development of indirect intrusions. Future studies looking at the presence and content of possible indirect intrusions in non-clinical samples are also warranted to determine the generalizability of the results of the current sample. Moreover, at the moment, it is unclear if the results of the current study can be generalized to offspring of survivors of other kinds of traumatic events, such as other wars or disasters. So comparable research into indirect intrusions needs to be conducted among other groups, for example, refugee families with post-war-born offspring.

Clinical implications

Even after 75 years, World War Two still impacts the survivors and, as the current study results indicate, also impacts the next generation in the form of indirect intrusions. A previous study in the same sample showed that these indirect intrusions were reported by 50% of the participants and that they elicited strong emotions of fear and distress in the offspring (Dashorst et al., 2020). Therefore we recommend special attention in the treatment of offspring to the presence, content, and emotional consequences of indirect intrusions about World War Two events. Interventions to reduce the impact of these intrusions need to be tailored to the cruel and frightening content, for example, by applying rescripting techniques. That is, rewriting the intrusion scene to involve a less distressing outcome may be helpful.

4

CHAPTER 5

Personal characteristics of World War Two survivor offspring related to the presence of indirect intrusions

Based on:
Dashorst, P., Huntjens, R. J. C., Mooren, T. M., Kleber, R. J., & de Jong, P. J. (2022). Personal characteristics of World War Two survivor offspring related to the presence of indirect intrusions. *European Journal of Psychotraumatology*, *13*(2), 2101349.

ABSTRACT

Background

A substantial proportion of clinical World War Two survivor offspring reports intrusions about war events they did not experience themselves.

Objective

To help identify factors that contribute to the development of such indirect intrusions (i.e., intrusions about non-self-experienced traumatic events), we examined the personal characteristics of survivor offspring that were related to the presence of indirect intrusions. To explore the specificity of these relationships, we compared characteristics related to the presence of *indirect* and *direct* intrusions (i.e., intrusions about self-experienced traumatic events).

Methods

Participants (N = 98) were post-war offspring of World War Two survivors in treatment in one of two clinics specialized in mental health services for war victims. We assessed the presence of indirect and direct intrusions as well as the following personal characteristics: gender, education level, trait dissociation, affect intensity, attentional control, mental imagery, fantasy proneness, and current psychopathology.

Results

Reports of *indirect* intrusions were more frequent in individuals high in fantasy proneness, trait dissociation, and current psychopathology. Reports of *direct* intrusions were more frequent in women, individuals scoring high on trait dissociation, affect intensity, and current psychopathology. Fantasy proneness was a unique correlate of indirect intrusions.

Conclusions

These findings are consistent with the idea that intrusions are the result of (re) constructive processes affected by several factors including personal characteristics.

INTRODUCTION

Involuntary, distressing memories have been associated with various mental disorders including posttraumatic stress disorder (PTSD) and depression (Michael et al., 2005; Williams & Moulds, 2007). Clinical observations, as well as empirical studies, have demonstrated that these intrusive memories do not only appear after *directly* (i.e., self) experienced traumatic events but may also occur in response to *indirectly* (i.e., not self) experienced nor personally witnessed traumatic events (Dashorst et al., 2020). Indirect intrusions were, for example, described by those whose loved ones were murdered or suffered from severe burn injuries although these relatives were not present at the time (Cella et al., 1988; Rynearson & McCreery, 1993). Another example includes paramedics who reported intrusions related to thoughts or fantasies about the cause of serious threat or injury of a traumatized patient (Michael et al., 2016). Intrusions may also be present as imagined future events. These flashforwards are defined as an intrusion of a self- experienced traumatic event with an imagined altered ending, for example among those who did a suicide attempt (Holmes, Crane, Fennell, & Williams, 2007). Flashforwards have been reported by people with general anxiety disorder, obsessive-compulsive disorder, and addiction disorders (Berntsen, 2019). The current study, however, is about non-self-experienced traumatic events. Finally, the last example of indirect intrusions, and the topic of the current study, concerns intrusions referring to parental war events in offspring of World War Two survivors (e.g., Dashorst et al., 2020; Wiseman, 2008; Yehuda et al., 1998a; also see Dashorst et al., 2019). These intrusions can have different forms: Offspring may report indirect intrusions of situations in which their parents were the 'actors' (i.e., victims of World War Two events), but they may also report intrusions in which these events 'apply' to themselves (i.e. they perceive themselves as an actor in the scene) (Yehuda et al., 1998b).

Most research on posttraumatic intrusions has been conducted in samples of participants who were diagnosed with PTSD according to the DSM-IV categorization (American Psychiatric Association [APA], 2000, p. 463), stating that 'a person has experienced, witnessed, or has been confronted with either an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others'. In the DSM-5 (American Psychiatric Association [APA], 2013, p. 274) this criterion for PTSD has been extended to 'learning that the traumatic event(s) occurred to a close family member or close friend. ... Experiencing repeated or extreme exposure to aversive details of the traumatic event(s) (e.g., first responders collecting human remains; police officers repeatedly exposed to details of child abuse)'. In spite of the implication that also indirect experiences may give rise to intrusions, dominant cognitive models of intrusions have focused on explaining intrusions in PTSD related to directly experienced traumatic events (Brewin & Holmes, 2003; Brewin et al., 2010;

Dalgleish, 2004; Ehlers & Clark, 2000). These cognitive models have in common that they postulate a special memory mechanism to explain intrusive memories (i.e., aberrant memory encoding of traumatic events). Trauma memories are considered to be poorly elaborated and inadequately integrated in their spatial and temporal context and intrusions are triggered by perceptual cues associated with the traumatic event.

Because these models focus on factors operating at the time of encoding of directly experienced events, they seem less applicable to explain the development of intrusive memories referring to indirectly experienced events. These intrusions might be better explained by applying a basic mechanism approach such as the mnemonic model (Rubin et al., 2008a, 2008b, 2011). The basic mechanism approach does not assume a special memory mechanism for the encoding of traumatic events but refers to general memory mechanisms involved in the encoding of emotional events. The model emphasizes factors operating at the time of retrieval of the traumatic event, at which time the memory is (re)constructed. The (re)constructive processes may be affected by several factors, including personal characteristics such as gender, education, aspects of personality (traits), and symptoms of mental disorders (Berntsen, 2009, 2010; Berntsen & Rubin, 2007; Rubin et al., 2008a). Such (re)constructive memory processes may not only help to understand the development of indirect intrusions but may similarly help to explain the development of direct intrusions. As a first step to shed light on the factors involved in the development of indirect intrusions, we compared several personal characteristics of participants with and without indirect intrusions.

THE PRESENT STUDY

The present study was designed to identify which personal characteristics are related to reports of indirect intrusions among World War Two survivor offspring. We conducted a cross-sectional study in a clinical sample of adult offspring of World War Two survivors. The parents of these offspring were survivors of the German or Japanese occupation during World War Two and the offspring sample was in treatment in one of two mental health centers specialized in war related problems in The Netherlands. In a previous publication, we reported on the frequency and characteristics of indirect intrusions in this sample, such as triggers, moods, kind of content, sensory characteristics, and physical sensations. These were found to be comparable to the frequency and characteristics of direct intrusions referring to offspring's direct (i.e., self-experienced) traumatic events (Dashorst et al., 2020).

In the current study, we systematically compared several personal characteristics of those World War Two survivor offspring patients who reported *indirect intrusions* versus those who did not report indirect intrusions. We also selected participants

who reported personally experienced traumatic events, and compared their personal characteristics to those who did not report *direct intrusions*. We focused on the following seven characteristics as delineated in the mnemonic model as well as in several previous empirical studies of intrusions related to directly experienced events: (1) *Gender*; This factor was selected given that women have been found to react with more PTSD symptomatology (including intrusions) in response to negative events compared to men (Berntsen & Rubin, 2006; Cahill, 2003); (2) *Education*, given that a lower education level has been found to be a risk factor for developing PTSD symptomatology. Education is considered to provide more cognitive resources for problem-solving in order to conceptualize traumatic events with less anxiety and contribute to reducing non-helpful emotions associated with intrusions (e.g. Brewin et al., 2000); (3) *Current psychopathology*, particularly (3a) *anxiety, depression* and (3b) *PTSD symptoms of arousal and avoidance* have been found to be related to the maintenance and enhancement of memories of stressful events (cf. Engelhard et al., 2007, 2003; Rubin et al., 2008a); (4) *Dissociation*. Trait dissociation is a predictor of intrusions and is also associated with a vulnerability to stress and avoidant processing of negatively valenced memories (Hagenaars & Krans, 2011; Rubin et al., 2008b); (5) *Affect intensity* (i.e., the emotional responsiveness of an individual). Individuals with high affect intensity tend to respond with stronger emotions to daily life events than individuals with lower affect intensity (Larsen & Diener, 1987); (6) *Attentional control*, (i.e., the ability to focus and maintain attention on thoughts and events in daily life). Weakened attentional control has been related to the occurrence of intrusive memories after a stressful event (e.g., Verwoerd et al., 2008); (7) *Mental imagery and fantasy proneness* (i.e., the inclination to be immersed in daydreams and fantasies with mental imagery). Fantasy proneness has been associated with false recall and recognition of neutral and trauma-related material (Geraerts et al., 2005; Merckelbach et al., 2001).

METHODS

Participants

The study sample consisted of adult World War Two survivor offspring (N = 98) in treatment at one of two Dutch centers specialized in war-related mental health problems. Both male and female offspring participated. The inclusion criteria were: (1) At least one of the biological parents or caretakers was a survivor of the German or Japanese occupation in World War Two; (2) Participants were born after the liberation (either May 5th 1945 in the Netherlands or August 15th 1945 in the Former Dutch East

Indies).[8] Exclusion criteria were: (1) Current (comorbid) diagnosis of schizophrenia and other psychotic disorders, and (2) Current alcohol or drug dependence as recorded in their personal file at the treatment center. The mean age of the participants was 55.64 years (*SD* = 6.92) and 57% was female. The median education level was bachelor's degree, with a range from primary school to university. This study is part of a larger research project (Dashorst et al., 2020).

Measures

The *Offspring Intrusive Memory Instrument* was developed for the purpose of this study and was based on the Autobiographical Memory Questionnaire (AMQ) developed by Rubin et al. (2008b; Rubin et al., 2011). The AMQ has been used by several research groups for over 30 years in various samples including trauma survivors. For the current study, the relevant items refer to the assessment of the indirect intrusions about World War Two events experienced by parents, the direct intrusions about self- experienced traumatic events, and the offspring's demographic data (e.g., age, gender, education). A broad definition of intrusive memories was included referring to images and/or thoughts that suddenly and involuntarily pop up in consciousness when awake without the intention to retrieve a memory.

The *PTSD Symptom Scale Self-Report* (PSS-SR; Foa et al, 1993) was used to assess posttraumatic stress symptoms. The scale consists of 17 items consistent with the 17 DSM-IV criteria for PTSD (Engelhard et al., 2007). The items are scored on a 4 point-scale range from 0 (not at all) to 3 (five or more times a week/almost always). For the purpose of this study, we included only the arousal and avoidance subscales. The PSS-SR Dutch version has good psychometric properties (Engelhard et al., 2007). In the current study, the Cronbach's alpha coefficient was .75 for the avoidance scale and .72 for the arousal scale.

Trait dissociation was assessed with the *Dissociative Experiences Scale* (DES) (Bernstein & Putnam, 1986; Carlson et al., 1993). The DES consists of 28 items describing dissociative experiences such as derealization and depersonalization. Participants indicate on a scale ranging from 0% (never) to 100% (always) the degree to which the experiences apply to them. The individual item scores were averaged to calculate the overall total DES score. The DES has good psychometric properties (Van IJzendoorn & Schuengel, 1996). In the current study Cronbach's alpha coefficient was .91.

Fantasy proneness was assessed using the *Creative Experiences Questionnaire* (CEQ; Merckelbach, Muris, Schmidt, Rassin, & Horselenberg, 1998). The CEQ is a 25-item self-report questionnaire with descriptions concerning developmental antecedents of fantasy proneness, profound involvement in fantasy and daydreaming,

8 The offspring did not experience World War Two themselves, although in the Former Dutch East Indies a liberation war (1945-1949) took place after the Japanese capitulation.

and consequences of daydreaming (e.g., 'As a child I had imaginary friends or toys' and 'When I think of something cold, I actually get cold'). Participants have to state whether they agree or not with the statements. The total score has a range of 0–25, with higher scores indicating higher levels of fantasy proneness. The CEQ has good psychometric properties (Merckelbach et al., 2001). In the current study Cronbach's alpha coefficient was .82.

The level of mental imagery was assessed using the *Vividness of Visual Imagery Questionnaire–2* (VVIQ-2; Marks, 1995). The VVIQ-2 consists of 32 items. Participants are instructed to describe the images of the intrusive scenes that come to their mind and to rate the vividness and clarity of each image on a five-point scale (1 = no image at all to 5 = perfectly clear and as vivid as normal vision). Higher scores on the total scale reflect higher vividness (range 32–160). The VVIQ-2 has shown to be a valid and highly reliable measure of self-reported vividness of visual imagery (Campos & Ferez-Fabello, 2009). In the current study Cronbach's alpha coefficient was .97.

Affect intensity, for instance emotional responsive- ness (how strongly people experience both their positive and negative emotions), was assessed with the *Affect Intensity Measure* (AIM; Larsen & Diener, 1987). The AIM consists of 40 items. Participants have to rate themselves on how they would react to the described events on a six-point scale 1 (never) to 6 (always). Scores are summed to get a total subscale score (range 40–240). Differences in affect intensity are related to affective, cognitive, and behavioural responses in different situations. It is proposed that affect intensity may have an arousal regulation function. The measure of affect intensity possesses adequate reliability and validity (Geuens & De Pelsmacker, 2002). In the current study Cronbach's alpha coefficient was .89.

Psychopathology was assessed using the *Brief Symptom Inventory* (BSI; de Beurs & Zitman, 2006; Derogatis, 1975; Derogatis & Melisaratos, 1983) a 53-item self-report measure with various subscales.

Respondents have to indicate the frequency of each symptom during the past week on a five-point scale from 0 (not at all) to 4 (a lot). Higher mean total scores indicate more severe psychopathology. The BSI has good psychometric qualities (Derogatis & Melisaratos, 1983). In the current study, only data on the depression and anxiety subscales are reported. In the current study, the Cronbach's alpha coefficient was .88 for the anxiety subscale and .90 for the depression subscale.

The level of attentional control was assessed using the *Attentional Control Scale* (ACS; Derryberry & Reed, 2002). The ACS consists of 20 items measuring attentional control. Participants have to score each item on a four-point scale 1 (almost never) to 4 (always). The total score on the ACS is the sum of all the items (after reversing the reverse-scored items; range 20–80). A higher score indicates better attentional control. The ACS has been shown to have adequate test-retest reliability and internal consistency (Fajkowska & Derryberry, 2010). In the current study, the Cronbach's

alpha coefficient was .88.

Procedure

We obtained written informed consent to obtain the participants' psychiatric diagnoses from their personal file at the treatment center and to use participant questionnaire data. All procedures were approved by the Medical Ethical Committee of University of Groningen Medical Centre. The participants completed the questionnaires in written form at home in the following order: (1) Offspring Intrusive Memory Instrument; (2) PTSD Symptom Scale Self-Report (PSS-SR); (3) Dissociative Experiences Scale (DES) (4) Creative Experiences Questionnaire (CEQ); (5) Vivid- ness of Visual Imagery Questionnaire-2 (VVIQ-2); (6) Affect Intensity Measure (AIM); (7) Brief Symptom Inventory (BSI); (8) Attentional Control Scale (ACS).

Statistical methods and results

Intrusions related to indirectly experienced events referring to World War Two

Table 1 shows the demographic characteristics of the participants. All participants (*N* = 98) indicated that their father and/or mother experienced traumatic events during World War Two, and 49% (*n* = 48) reported that they had intrusions referring to World War Two events. We compared these last-mentioned participants to participants who did not report indirect intrusions (*n* = 50). A Chi-square test for independence with Yates' continuity correction indicated that the groups with and without intrusions did not differ significantly in gender, X^2 (1, *n* = 98) = 0.19, *p* = .66, *phi* = –.07, and the independent sample *t*-tests indicated that the groups did not differ significantly in age, *t*(96) = – 1.09, *p* = .28, or level of education, *t*(96) = 1.10, *p* = .28.

Table 1

Demographic Characteristics of Participants

Variable	Parental event *N* = 98		Personal event *N* = 89	
	With intrusions (*n* = 48)	Without intrusions (*n* = 50)	With intrusions (*n* = 57)	Without intrusions (*n* = 32)
Gender				
Female n (%)	29 (60)	27 (54)	39 (68)	14 (44)
Male n (%)	19 (40)	23 (46)	18 (32)	18 (56)
Age				
Mean years (SD)	56.42 (6.19)	54.90 (7.51)	54.95 (7.02)	55.97 (6.52)
Education 1 (low, primary school) – 7 (high, university)	5.71 (1.24)	5.68 (1.19)	5.65 (1.11)	5.69 (1.40)

To explore the potential overlap between the group of individuals reporting direct intrusions with the group reporting indirect intrusions, we computed a cross-tab (see Table 2). A chi-square test for independence (with Yates' Continuity Correction) indicated a significant association between reports of indirect and direct intrusions, X^2 (1, *n* = 98) = .38, *p* < .001, *phi* = .38. This finding indicates that people reporting indirect intrusions also tend to report direct intrusions (medium effect). However, the overlap between participants who indicated direct and indirect intrusions is far from complete (11% only indirect intrusions; 20% only direct intrusions).

Table 2

Characteristics of Participants Reporting Intrusions Referring to Parental World War Two Events (N = 98)

Variable	With indirect intrusions[1] *M* (*n* = 48)	*SD*	Without indirect intrusions[2] *M* (*n* = 50)	*SD*	*df*	*t*	*p*	*Cohen's d*
DESmean	18.35	11.54	12.97	9.70	93	2.46	.016	0.51
CEQtot	8.79	4.62	6.25	3.81	94	2.94	.004	0.61
VVIQIItot	111.36	26.05	103.98	26.41	89	1.34	.183	0.29
AIMtot[3]	3.64	0.48	3.48	0.64	86.88	1.38	.172	0.30
ACStot	50.47	10.46	48.27	9.62	93	1.07	.289	0.22
BSI subscales								
Depression	10.23	7.01	8.31	5.99	94	1.44	.153	0.30
Anxiety	8. 91	5.78	6.19	5.78	92	2.29	.025	0.48
PSS-SR subscales								
Avoidance	9.63	4.30	6.96	4.98	94	2.81	.006	0.58
Arousal	9.48	3.78	6.96	3.92	94	3.21	.002	0.66

Note. Missing variable data [1] VVIQ (four participants), ACS (one participant), BSI anxiety (one participant),
[2] DES (three participants), CEQ (two participants), VVIQ (three participants), AIM (two participants), ACS (two participants), BSI depressions (two participants), BSI anxiety (three participants), PSS-SR avoidance (two participants), PSS-SR arousal (two participants). BSI = Brief Symptom Inventory; PSS-SR = PTSD Symptom Scale Self-Report; DES =Dissociative Experiences Scale; CEQ = Creative Experiences Questionnaire; VVIQ = Vividness of Visual Imagery; AIM = Affect Intensity Measure; ACS = Attentional Control Scale.
[3] AIM Levene's test for equality of variances indicated violations of the assumption of equal variances (*p* = .017). For this variable, the equal variances not assumed *t*-value is reported.

Table 3 shows the scores of the various other characteristics of participants with and without intrusions about parental World War Two events. We conducted independent samples t-tests to investigate differences between the groups for these variables. The results indicated that, compared to participants without indirect intrusions, participants with World War Two-related intrusions showed significantly higher scores on the DES, CEQ, the BSI anxiety subscale, and the PSS-SR avoidance and arousal subscales (all medium effect size).

Table 3
Characteristics of Participants Reporting Intrusions Referring to Parental World War Two Events (n = 98)

Variable	With direct intrusions[1] *M* (*n* = 48)	*SD*	Without direct intrusions [2] *M* (*n* = 50)	*SD*	*df*	*t*	*p*	*Cohen's d*
DESmean	18.35	11.54	12.97	9.70	93	2.46	.016	0.51
CEQtot	8.79	4.62	6.25	3.81	94	2.94	.004	0.61
VVIQIItot	111.36	26.05		26.41	89	1.34	.183	0.29
AIMtot[3]	3.64	0.48	3.48	0.64	86.88	1.38	.172	0.30
ACStot	50.47	10.46	48.27	9.62	93	1.07	.289	0.22
BSI subscales Depression	10.23	7.01	8.31	5.99	94	1.44	.153	0.30
Anxiety	8.91	5.78	6.19	5.78	92	2.29	.025	0.48
PSS-SR subscales Avoidance	9.63	4.30	6.96	4.98	94	2.81	.006	0.58
Arousal	9.48	3.78	6.96	3.92	94	3.21	.002	0.66

Note. Missing variable data
[1] VVIQ (four participants), ACS (one participant, BSI anxiety (one participant)
[2] DES (three participants), CEQ (two participants), VVIQ (three participants), AIM (two participants), ACS (two participants), BSI depressions (two participants), BSI anxiety (three participants), PSS-SR avoidance (two participants), PSS-SR arousal (two participants)
[3] AIM Levene's test for equality of variances indicated violations of the assumption of equal variances (p = .017). For these variable, the equal variances not assumed t-value is reported.
DES = Dissociative Experiences Scale; CEQ = Creative Experiences Questionnaire; VVIQ = Vividness of Visual Imagery; AIM = Affect Intensity Measure; ACS = Attentional Control Scale. BSI = Brief Symptom Inventory; PSS-SR = PTSD Symptom Scale Self-Report

Intrusions related to directly self-experienced traumatic events

We performed the same analysis to examine personal characteristics related to those who reported intrusions of *self-experienced* traumatic events versus those who did not. A subsample of 91% (n = 89) of the total sample reported that they had experienced or directly witnessed one or more personal traumatic events.[9] The most often reported events were physical assault, unwanted sexual experiences, sudden unexpected death of loved one, and motor vehicle accidents. Of these participants, 64% indicated that they had experienced one or more direct intrusions (Table 1). A Chi-square for independence with Yates' continuity correction indicated that statistically significant more women than men reported direct intrusions (medium effect size), X^2 (1, n = 89) = 4.21, p = .04, *phi* = –.24. An independent samples t-test indicated that the participants with and without direct intrusions did not differ significantly in age, t(87) = 0.68, p = .50, or education level, t(87) = 0.14, p = .89 (Table 1).

Table 4 shows the scores on the characteristics of participants with and without direct intrusions. We conducted independent samples t-tests to investigate differences between the groups on these variables. Participants with direct intrusions showed significantly higher scores on the DES, AIM, BSI depression sub- scales (medium effect sizes) and BSI anxiety subscale, PSS-SR avoidance and arousal subscales (large effect sizes) than participants without these intrusions.

9 The subsample who reported parental World War Two events and did not report self-experienced events was small (n = 9) and was therefore not analysed separately.

Table 4
Characteristics of Participants Reporting Intrusions Referring to Self-experienced Traumatic Events (n = 89)

Variable	With direct intrusions[1] *M* (*n* = 57)	*SD*	Without direct intrusions [2] *M* (*n* = 32)	*SD*	*df*	*t*	*p*	*Cohen's d*
DESmean	18.26	10.95	12.68	10.67	84	2.25	.027	0.52
CEQtot	8.11	4.35	7.13	4.70	85	0.96	.338	0.22
VVIQIItot	109.04	25.56	104.93	25.64	80	0.70	.486	0.16
AIMtot	3.63	0.55	3.37	0.59	85	2.06	.043	0.46
ACStot	49.88	11.11	48.50	8.17	85	0.96	.540	0.34
BSI subscales								
Depression[3]	10.49	6.80	6.97	5.34	72.325	2.65	.010	0.58
Anxiety[3]	9.38	6.00	4.34	4.63	70.616	4.28	<.001	0.94
PSS-SR subscales								
Avoidance	10.09	4.56	5.50	4.20	85	4.58	<.001	1.17
Arousal	9.91	3.42	5.57	3.79	85	5.43	<.001	1.20

Note. Missing variable data [1] VVIQ (four participants), BSI anxiety (one participant)
[2] DES (three participants), CEQ (two participants), VVIQ (two participants), AIM (two participants), ACS (three participants), BSI depressions (two participants), BSI anxiety (three participants), PSS-SR avoidance (two participants), PSS-SR arousal (two participants)
[3] Levene's test for equality of variances indicated violations of the assumption of equal variances for BSI depression (p = .041) and anxiety (p = .047) sub-scales. For these variables, the equal variances not assumed t-value is reported.
DES = Dissociative Experiences Scale; CEQ = Creative Experiences Questionnaire; VVIQ = Vividness of Visual Imagery; AIM = Affect Intensity Measure; ACS = Attentional Control Scale. BSI = Brief Symptom Inventory; PSS-SR = PTSD Symptom Scale Self-Report

DISCUSSION

The major aim of the present study was to identify personal characteristics that are associated with reports of intrusions related to *indirectly* experienced traumatic events in a sample of World War Two survivor offspring. As a comparison, we determined personal characteristics associated with reports of intrusions related to personal (i.e., directly) experienced traumatic events. The results indicated that participants with indirect intrusions reported more trait dissociation, fantasy proneness, and current psycho- pathology including general anxiety, trauma-related avoidance and trauma-related arousal than those who did not report indirect intrusions. These characteristics were also associated with reports of direct intrusions, except for fantasy proneness. Fantasy proneness thus seemed a unique correlate of indirect intrusions. Noteworthy is the finding that a part of the participants reported indirect as well as direct intrusions (37 out of 98). This could be an indication that the same mechanism contributes to both types of intrusions with the mnemonic model as a possible candidate model. However, the overlap between participants who indicated direct and indirect intrusions is far

from complete (11% only indirect intrusions; 20% only direct intrusions) so both types of intrusions seem also worthwhile to study as relatively independent phenomena.

We also found several variables to be associated with *direct* but not *indirect* intrusions. These included gender (i.e., participants who reported direct intrusions were more often female), current depression (the presence of direct intrusions was related to higher levels of depression) and affect intensity (presence of direct intrusions related to higher levels of affect intensity). Finally, level of education, imagery ability, and attentional control were neither associated with reports of indirect nor with reports of direct intrusions.

Fantasy proneness is referring to a disconnection from reality and creatively reshaping it (Weibel et al., 2018). Previous research has linked fantasy proneness to psychopathology. For example, Bacon and Charlesford (2018) found that fantasy proneness was related to emotional distress. They identified two subtypes of fantasizing, creative fantasy (the activity of using fantasy to create new ideas) and imaginative fantasy (the activity of vividly imagining and ease of becoming absorbed in images and daydreams), which were found to be differentially associated with emotional distress. Creative fantasy was linked to adaptive and maladaptive coping but showed in contrast to imaginative fantasy no relation with emotional distress. Unfortunately, the fantasy measure used in the current study (CEQ; Merckelbach et al., 1998) does not differentiate between both types of fantasy proneness. It remains therefore to be examined in future research whether the presence of indirect intrusions would be especially related to high imaginative fantasy (e.g., by using the Fantasy Questionnaire; Weibel et al., 2018).

Other characteristics related to reports of indirect intrusions included trait dissociation and current psychopathology, specifically general anxiety and post-traumatic avoidance and arousal. A possible mechanism explaining the link between trait dissociation and indirect intrusions is hyper-associativity (i.e., enhanced automatic activation of associations in memory). In hyper-associativity, in contrast to adaptive associativity, activated associations in memory are more emotion-driven and less semantically related to the cue. A recent study has shown a positive association between depersonalization (i.e., an aspect of trait dissociation), hyper-associativity, and fantasy proneness (Huntjens et al., 2021). With regard to current psychopathology, it may be that these intrusions, although unrooted in reality, are perceived as real and cause fear and stress. Alternatively, current psychopathology may contribute to reports of intrusions (cf. Engelhard et al., 2007). As the current study is a cross-sectional study, we cannot derive the direction of the relationship between these factors.

Gender, affect intensity, and current depression were not related to indirect intrusions, but, consistent with previous research, were related to the occurrence of direct intrusions. It is well documented that women are more prone to depression than men (e.g., Hankin & Abramson, 2001; Kuehner, 2003). Gender differences in

emotional autobiographical memories are also well-documented. For example, Davis (1999) showed that women recalled more childhood memories about emotional events and had faster access to such memories than men. Seidlitz and Diener (1998) found that women recalled more memories than men when requested to recall as many positive and negative experiences as possible within a short time period. Because of these gender differences in autobiographical memory, and related differences in affect intensity, women have been suggested to be more likely than men to develop PTSD symptoms following a similarly negative event (Rubin et al., 2008a). How- ever, previous studies did not indicate gender differences in fantasy proneness. Neither did we find differences in fantasy proneness between men and women in the current study, [t (46) = 0.44, p = .65], which may explain why females were not more likely to report indirect intrusions in the current study.

Finally, level of education, imagery ability, and attentional control were not associated with either indirect or direct intrusions. An explanation for the lack of a hypothesized association between the presence of intrusion and level of education or attentional control could be that our sample was homogeneous with regard to these variables. In the absence of realistic information about the circumstances of the past, gaps in knowledge may be filled by imagination in an attempt to make sense of the past and present. In contrast, in the case of direct intrusions, the lack of association between imagery and intrusions indicates that imagining possible events is not sufficient to develop intrusions. In the case of indirect intrusions, the element of creatively coming up with adding elements to form a new coherent picture or story in the mind (i.e., fantasy proneness imaginative fantasy pathway) may be essential. In the case of direct intrusions, vivid imagery does not seem to add to the image based on the events as they were self- experienced.

It should be acknowledged, however, that the partial overlap in outcomes of trait dissociation and current complaints (Tables 3 and 4) may be partly due to the fact that both direct and indirect intrusions were reported by the same participants. Yet, this overlap cannot explain all of the results. Especially the role of fantasy proneness as a predictor appeared specific for reports of indirect intrusions.

The current finding that the presence of indirect intrusions is related to individual differences in fantasy proneness, is consistent with the mnemonic model of PTSD (Rubin et al., 2008a). Rather than focusing on aberrant encoding processes operating at the time of experiencing the negative event, this model emphasizes the (re) constructive nature of memory retrieval. This model states that it is the inter- action between memory (re)construction and the many factors influencing this process (e.g., individual differences and a person's current attitudes and goals) that determines whether intrusions will develop.

Limitations

In the current sample 50% of the participants reported indirect intrusions. A limitation of the current study is, however, that participants were recruited from a *clinical* sample of World War Two survivor offspring, which limits the external generalizability of the results. It can therefore not be ruled out that the current findings do not apply to non-treatment seeking World War Two survivor offspring.

A further limitation is that we did not examine the content of the reported indirect intrusions. A qualitative analysis concerning the content of this indirect intrusions may be helpful in providing a more in-depth understanding of the impact of parental World War Two events on offspring (Braga, Mello, & Fiks, 2012). An interesting aspect to investigate would, for example, be the perspective of the reported scenes: this may vary from scenes in which parents are the 'actors' to scenes in which the offspring performs as one of the actors in the scene (cf. Yehuda et al., 1998b).

Another interesting area for future research is the possible role of direct trauma in the development of indirect intrusions. In the current study, the majority of the participants reported some form of personal trauma (e.g., car accidents, physical violence, sexual assault, unexpected death of a relative). This characteristic of the sample may be unrelated or alternatively be related to their upbringing by sometimes traumatized parents, rendering them more vulnerable to experience future traumatic events and corresponding direct intrusions (Leen-Feldner et al., 2013). Alternatively, personal trauma and related PTSD complaints may play a role in the development of indirect intrusions of World War Two events. This hypothesis would be in line with the mnemonic model suggesting that current complaints influence the construction of past event memories. Indirect intrusions of the war atrocities experienced by their parents, may, for example serve the function of explaining the difficulties experienced by the offspring while growing up, such as anxiety, agitation with sudden outbursts of parental anger or difficulties associated with their parents being often distracted and not available for them. Whereas the current study was a necessary first step, future (longitudinal) studies are necessary to disentangle the exact mechanism(s) involved.

Clinical implications

The outcomes of this study may have clinical implications for the treatment of intrusions. Fantasy proneness was a unique correlate of indirect intrusions. The capacity to construct images in the mind can be used to an advantage in the clinical setting, for example by applying the imagery rescripting technique in patients with indirect intrusions. With the help of these techniques, the stress-provoking content of (threatening) indirect memories can perhaps be more easily reconstructed to non-threatening content meeting the basic needs of the patient (e.g., safety) for those with relatively high fantasy proneness (Hackmann, 2011). In sum, this study demonstrated that partly different personal characteristics were associated with the occurrence of indirect versus direct intrusions among World War Two survivor offspring. These findings are consistent with the mnemonic model of PTSD, which emphasizes that intrusions are the result of (re)constructive processes that can be affected by several factors including personal characteristics such as fantasy proneness.

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CHAPTER 6

General discussion

The research covered in this dissertation aimed to enhance the understanding of intrusions. Intrusions of negative past events are a significant feature of the diagnosis posttraumatic stress disorder (PTSD, APA, 2013). Whereas the so-called *special mechanism models* explain intrusions as the result of aberrant encoding of memories of traumatic events, the more recently developed *mnemonic model* does not assume a special memory mechanism but rather forwards an explanation of intrusions based on general memory functioning principles, emphasizing factors operating at the time of retrieval (instead of encoding). One way to test predictions based on the special mechanism models versus the mnemonic model is to investigate intrusions in people who did not experience or directly witness a traumatic event but nevertheless developed intrusions related to the event. In other words, people who experience *indirect intrusions*. Whereas the occurrence of this type of intrusion cannot be explained by special mechanism models, the mnemonic model can account for this type of memories and assumes the same memory retrieval processes to be involved in both direct and indirect intrusions. The aim of the current dissertation was, therefore, to investigate the occurrence, content, and characteristics of intrusions in a sample reporting both indirectly and directly experienced traumatic events. The study relied on a sample of now-adult post-World War Two-born survivor offspring with severely traumatized parents. All participants received psychotherapeutic treatment at one of two Dutch treatment centers specialized in treating war-related mental health problems.

The following research questions were addressed :

- Does World War Two survivor offspring experience intrusions that refer to non-self-experienced traumatic events (indirect intrusions)? If so: How do the characteristics of such indirect intrusions compare to characteristics of intrusions referring to self-experienced traumatic events?
- What is the content of participants' World War Two-related indirect intrusions?
- What type of participant characteristics are associated with either kind of intrusions?

Chapter 1 presented a general introduction to previous studies of direct and indirect intrusions related to traumatic events, together with a brief overview of relevant theoretical models. Next, the choice for the specific study population, (i.e., World War Two survivor offspring) was explained . Chapter 2 presented a review of studies on Holocaust survivor offspring with the aim to increase the understanding of the impact of being raised in a family with Holocaust survivor parents on the mental health of their offspring. Although community studies provided no evidence for a specific 'survivor offspring' disorder, a co-occurrence of having a Holocaust survivor parent with mental health difficulties and mental health problems in his or her offspring has been

reported. The review chapter provided a more detailed analysis of this association. The results indicated that, among others, parental mental health problems, the quality of the perceived parent-child relationship, having two survivor parents compared to one survivor parent, and having a mother as a survivor compared to a father appeared to be more associated with the mental well-being and modification of cortisol metabolism and epigenetic processes in the offspring. Chapters 3 to 5 describe an empirical study on intrusions in World War Two survivor offspring. In Chapter 3, the occurrence, frequency, and characteristics of indirect intrusions about traumatic World War Two events were compared to those of direct intrusions about self-experienced traumatic events. Chapter 4 reported on a qualitative thematic analysis of the content of the offspring's indirect intrusions about World War Two-related events in an attempt to provide an in-depth understanding of the themes of the intrusions that were impacting the mental health of World War Two survivors' offspring. Finally, chapter 5 examined the association between the presence of (in)direct intrusions and particular personal characteristics for which the mnemonic model predicts that these would promote the development of (in)direct intrusions.

THE OCCURRENCE AND CHARACTERISTICS OF INDIRECT AND DIRECT INTRUSIONS

Some participants experienced no intrusions, some only direct or only indirect intrusions and others mentioned both kind of intrusions; the percentage of people in this sample with intrusions referring to World War Two events was similar to the percentage of people reporting intrusions related to directly experienced traumatic events. Another finding was that indirect intrusions did not differ from direct intrusions in the characteristics of vividness, intensity, or uncontrollability. Further, both types of intrusions predominantly had the form of images or thoughts and were accompanied by strong physical sensations. We thus found more commonalities than differences between the two types of intrusions. Moreover, based on the phenomenology of intrusions, it can thus not be delineated if the event which is central in the intrusion, was experienced by the person experiencing the intrusion.

Despite several similarities in characteristics between direct and indirect intrusions, we also found a difference. That is, participants perceived their indirect intrusions as more fabricated, while their direct intrusions were perceived as more real.

THE CONTENT OF INDIRECT WORLD WAR TWO-RELATED INTRUSIONS

Qualitative analysis revealed that the reported intrusions were mostly visual images of terrifying World War Two scenes, such as cruel impressions of Nazi concentration camps, gas-chambers, Japanese internment camps, deportation, people dying, dead bodies, violence, humiliation, separation of family members, illness, and starvation. Emotional experiences were central in the intrusions (mostly fear, anxiety, and vulnerability), and examples such as "*I feel my father's panic*…." indicates that the participant identified with the parent in the intrusion. Furthermore, the intrusions mostly described a first-person viewpoint. The latter is, for example, demonstrated by the following quote: " *I walk in the campgrounds. A guard approaches me with a large, aggressive dog*". Finally, the descriptions of indirect intrusions mostly entailed a short fragment, an image, or a snapshot about the horrifying event, not a whole story with a beginning, main part (e.g., worst moment), and ending.

PARTICIPANTS' PERSONAL CHARACTERISTICS ASSOCIATED WITH DIRECT AND INDIRECT INTRUSIONS

Who is prone to develop indirect intrusions, in other words, what characterizes these participants? We considered the following individual differences: gender, education level, trait dissociation, affect intensity, attentional control, mental imagery, fantasy proneness, and current psychopathology. The results indicated that indirect and direct intrusions were both associated with trait dissociation and current psychopathology, including general anxiety, trauma-related avoidance, and trauma-related arousal. However, fantasy proneness (the tendency to immerse in imagination) proved to be significantly associated with the occurrence of indirect intrusions, but it was not associated with the occurrence of direct intrusions. Indirect intrusions were equally reported by men and women, while participants with direct intrusions were more often female. Finally, people with direct intrusions reported more intense symptoms of depression than those without, whereas this difference was not found between those with versus without indirect intrusions.

THEORETICAL IMPLICATIONS

What are the theoretical implications of these findings? The special mechanism models cannot explain the occurrence of indirect intrusions as a result of aberrant encoding given that the offspring did not experience World War II. The mnemonic

model, with its emphasis on the reconstruction processes present during retrieval of event memories (long) after an event has occurred, on the other hand, does allow for an explanation of indirect intrusions based on the construction of a mental image of a negative event. This model assumes that the reconstruction of direct and construction of indirect intrusions adhere to the same general principles of mental functioning. The mere occurrence of indirect intrusions, the similarities in frequency and characteristics of indirect and direct intrusions, and the commonalities in individual characteristics associated with direct and indirect intrusions found in the current research thus support the mnemonic model as a tool to explain (direct and indirect) intrusions.

The results of the current dissertation agree with the results of other studies indicating that experiences later in life may contribute to reconstructing an event as traumatic in retrospect years later (Engelhard et al., 2019). Likewise, in the current study, current mental complaints may have contributed to the construction of intrusions related to negative events not personally experienced but based on information provided by parents, other sources, or imagination. The results of the current study also converge with results from other studies in support of the mnemonic model, for example, a recent analog trauma study using Virtual Reality (VR). In a diary study, thirty-two students were exposed to the same event in a VR environment (Nielsen et al., 2020). Directly after being exposed to the event, the participants identified hotspots (i.e., the most frightening or dangerous part of the event) and kept a diary for one week with the instruction to report all involuntary and voluntary memories about the event. The results indicated that whereas some participants reported intrusions with similar descriptions of the hotspots a week later, others did not report an exact copy of the hotspot, or they reported other hotspots (Berntsen & Nielsen, 2021). These results thus indicate that an intrusive memory can also represent a (re)construction of a hotspot/an event with aspects changed, the occurrence of which most parsimoniously can be explained by the mnemonic model.

We found most hypothesized individual differences to be indeed associated with both direct and indirect intrusions. The finding that fantasy proneness was only associated with indirect intrusions can be interpreted as further support of the mnemonic model. Fantasy proneness includes two subtypes: creative fantasy (i.e., the activity of using fantasy to create new ideas) and imaginative fantasy (i.e., the activity of vividly imagining and the ease of becoming absorbed in images and daydreams) (Weibel et al., 2018). Both subtypes may interfere with memory (re)construction processes. The two subtypes could not be differentiated in the current study. In future research, it will be worthwhile to find out which fantasy proneness subtype is associated with the occurrence of indirect intrusions, as it can help understand the exact mechanisms involved in indirect intrusions. Creativity contributes to generating new ideas: mixing them with or adding them to existing memories will create a renewed image that, in turn, can be re-encoded, changing the memory. When imaginative fantasy increases,

images may be experienced as more realistic. As long as adequate reality testing is present, the individual will be aware that it is a mental image. With failing reality testing, however, high imaginative mental images could be involved in phenomena resembling psychosis..

Other individual differences related to the occurrence of both indirect and direct intrusions included trait dissociation and current psychopathology (i.e., specifically general anxiety and posttraumatic avoidance and arousal). A possible mechanism explaining the link between trait dissociation and indirect intrusions is hyper-associativity (i.e., enhanced automatic activation of associations in memory). In hyper-associativity, in contrast to adaptive associativity, activated associations in memory are more emotion-driven and less semantically related to the cue. A recent study has shown a positive association between depersonalization (i.e., an aspect of trait dissociation), hyper-associativity, and fantasy proneness (Huntjens et al., 2021), but as this study was in a student sample, it calls for replication in a patient sample. With regard to current psychopathology, the results of the current study are consistent with results of previous studies indicating that mood and anxiety disorders are associated with the occurrence of direct intrusions (Berntsen, 2010; Brewin, 2007, 2010; Engelhard et al., 2007; Holmes et al., 2007). The results of the current study further indicated that current psychopathology was also linked to the occurrence of indirect intrusions. The direction of the relationship between intrusions and current psychopathology could not be established. On the one hand, it may be that indirect intrusions, although not directly rooted in the offspring's reality, are perceived as real and cause fear and stress. On the other hand, it may also be that psychological problems contribute to the development of indirect intrusions.

IMPLICATIONS FOR CLINICAL PRACTICE

Besides theoretical implications, the results of this dissertation point to possible implications for clinical practice. World War Two was a gruesome and atrocious period with far-reaching consequences for individuals and society at large. It is a remarkable finding that not only parents can be affected by intrusions but also that their offspring reported World War Two-related intrusions. The offspring's indirect intrusions pertained to horrifying details of World War Two events accompanied by mental symptoms such as anxiety and depression. Although the findings in the current dissertation are inconclusive regarding the causal direction of the relationship between intrusions and the reported symptoms, it is recommended to ask clinical survivor offspring on a standard basis about the occurrence of indirect intrusions also in the absence of PTSD, as these intrusions may be highly distressing and may require special attention during psychotherapeutic treatment. Although most research has been conducted on World

War Two survivor offspring, it is also recommended to be aware of indirect intrusions in children of parents who survived (more) recent wars.

Furthermore, the association between indirect intrusions and fantasy proneness suggests that creative people are at risk for developing indirect intrusions. However, their high score on this trait might also be turned into their advantage. For example, the application of interventions that use imagination has been shown to be effective in direct intrusions (Raabe et al., 2022). An example would be the application of imaginary rescripting, a psychotherapeutic technique used to change the aversive parts of a memory and reconstruct it to a less frightening memory and, in that way, reduce the impact of aversive memories (Arntz, 2012; Rijkeboer et al., 2020; Strohm et al., 2019). The ability to use fantasy might thus be helpful in rescripting mental images, changing the intrusion into a less distressing image, and reducing the associated negative emotions.

STRENGTHS AND LIMITATIONS

A strength of the current study was the mixed methods approach (i.e., a combination of quantitative and qualitative analyses) to study intrusions, providing an overview as well as a more in-depth look at the content of the intrusions reported. A second strength relates to the sample. The current research studied the occurrence of indirect versus direct intrusions in a sample of postwar-born offspring with mental health problems. This offspring generation constituted a unique population reporting mental health problems related to events not personally experienced. However, the generalizability of the findings is limited because we studied a sample of participants of parents who experienced World War Two. The findings, therefore, cannot be generalized to offspring of otherwise traumatized parents. Another limitation is that the offspring's parents were not included in the study and therefore no direct information was available about them. The information about the parents collected in the study was based on the participants' (childhood) memories and observations of their parents as well as the communication about the war between parent and child. A final limitation may be related to the choice for the *Creative Experiences Questionnaire* (CEQ; Merckelbach et al., 1998) as a measure of fantasy proneness. Although often used in other studies, the CEQ does not distinguish between the creative and imaginative subtypes. Consequently, it is unclear to what extent both subtypes are involved in the development or maintenance of indirect intrusions. To learn more about the relevance in this context of each subtype, it is recommended to use the Fantasy Questionnaire for future studies as this questionnaire distinguishes between creative and imaginative subtypes of fantasy proneness (Weibel et al., 2018).

IMPLICATIONS FOR FURTHER RESEARCH

The context of growing up in a family with World War Two survivor parents may have impacted the offspring and may have contributed to the occurrence of indirect intrusions about traumatic war events. More specifically, the parental mental health problems, the parent-child relationship, and the parents' communication about the war may have impacted the offspring's mental health problems. Unfortunately, we did not have direct information about these factors. For example, we do not know to what extent offspring participants witnessed their parent(s) having trauma-related symptoms such as flashbacks, severe anxiety, and irritability. Offspring participants reported that most parents did not speak much about their war experiences. In addition, a small number indicated that their parents did not mention the war at all, whereas others reported that their parents spoke extensively about what they had been gone through. The manner of communication also varied: the war was either discussed in veiled terms or very frank with factual and detailed information about what had happened (Chapter 4). To further our understanding of the mechanism(s) determining the development of indirect intrusions, it would be relevant for future studies to include data on current and previous mental health problems of parents, and a more detailed assessment of communication between parents and children about the events experienced in the war, supplemented with observations of the interaction between parent and child (e.g., in observational lab studies). This knowledge may be helpful to distinguish which offspring may be at risk for developing indirect intrusions. Finally, to shed more light on the direction of the relation between current offspring psychopathology and the occurrence of indirect intrusions a future study with a longitudinal design would be useful.

CONCLUSION

The results of this dissertation indicate that intrusions related to World War Two can occur in the next generation, that is, the adult offspring born after the war had ended. The frequency and characteristics of indirect intrusions were found to be comparable to those of direct intrusions whereas individual characteristics such as fantasy proneness may play a role in its origin. In addition, the content of these indirect intrusions can be gruesome and is accompanied by various emotions. These results entail a warning with current war-stricken populations and all other severely traumatized parents in mind. More specifically, they indicate that children of survivors of other wars, for example, those from Afghanistan, Syria, Ruanda, Ukraine, may also suffer from these long-term intergenerational consequences of war. Moreover, offspring of victims who experienced other forms of trauma (e.g., long-term domestic violence) may also need to be protected against the intergenerational consequences of traumatic events.

6

APPENDICES

Nederlandse samenvatting

SAMENVATTING **Summary in Dutch**

Het doel van dit proefschrift was om intrusies beter te kunnen begrijpen. Intrusies zijn onvrijwillig, spontaan optredende beelden of gedachten die zich vaak voordoen na schokkende ervaringen zoals geweld, rampen of oorlog. Bij de meeste mensen zijn deze intrusies van de schokkende gebeurtenis een korte periode aanwezig. Bij anderen blijven ze zich langer opdringen of verschijnen ze later in het leven en kunnen dan symptomen van een posttraumatische stress-stoornis (PTSS) zijn (DSM-5; American Psychiatric Association, 2013). Behalve bij PTSS worden intrusies soms ook ervaren bij andere mentale/psychische problemen zoals angststoornissen, obsessief-compulsieve stoornissen, verslaving en suïcidaliteit (Berntsen, 2010; Brewin, 2007, 2010; Holmes et al., 2007).

Bovendien hebben klinische observaties aangetoond dat intrusies ook betrekking kunnen hebben op situaties waarbij men niet zelf aanwezig was. Een voorbeeld hiervan zijn personen van wie een naaste ernstige brandwonden had opgelopen of het slachtoffer van moord was, terwijl de persoon met de intrusies zelf niet aanwezig was bij deze gebeurtenis. Daarnaast zijn dergelijke intrusies ook gerapporteerd door (para)medici na de behandeling van ernstig getraumatiseerde patiënten (Celia et al., 1988; Michael et al., 2016; Rynearson & McCreery, 1993). Een voorbeeld uit mijn persoonlijke klinische praktijk is de zoon van een Holocaustoverlevende die vertelde over beangstigende intrusies met gedetailleerde voorstellingen van kinderen die vermoord worden in gaskamers. Deze observaties roepen de vraag op hoe vaak deze "indirecte" intrusies, dus intrusies over gebeurtenissen waar men zelf niet bij aanwezig was, voorkomen en hoe ze theoretisch verklaard kunnen worden.

Om het inzicht in het optreden van intrusies en factoren die bijdragen aan het ontstaan ervan te vergroten waren de volgende onderzoeksvragen leidend in dit proefschrift. Alle studies werden uitgevoerd in een klinische steekproef van kinderen van Tweede Wereldoorlogoverlevenden.

- Hebben (inmiddels volwassen) kinderen van overlevenden van de Tweede Wereldoorlog intrusies over niet-zelf ervaren traumatische gebeurtenissen (indirecte intrusies)? En zo ja: hoe verhouden de kenmerken van dergelijke indirecte intrusies zich tot intrusies die verwijzen naar zelf ervaren traumatische gebeurtenissen?
- Welk individuele kenmerken van de respondenten zijn geassocieerd met beide vormen van intrusie?
- Wat is de inhoud van de indirecte intrusies over de Tweede Wereldoorlog bij de respondenten?

Hoofdstuk 1 start met een algemene introductie waarin een samenvatting wordt gegeven van de theoretische verklaringsmodellen van intrusies en de onderzoeksopzet van dit proefschrift wordt besproken. *Hoofdstuk 2* betreft een systematische review

naar de gevolgen van de Tweede Wereldoorlog, meer specifiek de Holocaust, op na de oorlog geboren kinderen van overlevenden. De *hoofdstukken 3, 4 en 5* beschrijven de belangrijkste bevindingen van de empirische kwantitatieve en kwalitatieve studie naar indirecte en directe intrusies bij deze naoorlogse generatie. Ten slotte worden de verschillende studies geïntegreerd in *hoofdstuk 6* met aandacht voor de theoretische en klinische implicaties.

De meeste theoretische verklaringsmodellen van intrusies zijn gebaseerd op intrusies over zelf meegemaakte gebeurtenissen in de context van PTSS en gaan ervan uit dat de opslag in het geheugen van traumatische gebeurtenissen anders verloopt voor traumatische dan van niet-traumatische gebeurtenissen. Deze verklaringsmodellen hebben onder andere de volgende basisprincipes gemeen: (a) peritraumatische processen (bijvoorbeeld dissociatieve ervaringen) beïnvloeden het opslaan van de gebeurtenis, de gebeurtenis wordt daardoor onvoldoende gekoppeld aan de context (bijvoorbeeld in tijd en plaats) waarin deze plaatsvond, (b) de afwijkende geheugenprocessen leiden tot inadequate integratie in het autobiografisch geheugen, (c) het gebrek aan integratie maakt dat deze herinneringen vaker onvrijwillig herinnerd worden en tegelijkertijd minder beschikbaar zijn als vrijwillige herinneringen (Berntsen, 2010; Brewin, 2007, 2010; Holmes et al., 2007).

Met deze modellen kunnen indirecte intrusies, dus intrusies over gebeurtenissen die men niet zelf heeft meegemaakt en waarvan men dus geen directe getuige was, echter niet verklaard worden. Het voorkomen van dit type "indirecte" intrusies kan wel worden verklaard aan de hand van het zogenaamde *mnemonsich model* (Rubin et al., 2008a, 2008b). Dit model stelt dat bij de opslag en het onvrijwillig én vrijwillig terughalen van traumatische en niet-traumatische gebeurtenissen dezelfde geheugenprocessen een rol spelen. Met andere woorden, volgens dit model is het niet nodig een specifiek geheugenmechanisme te veronderstellen dat voorbehouden is aan het verwerken van traumatische gebeurtenissen.

Tevens gaat dit model ervan uit dat het herinneren van een gebeurtenis een reconstructief proces is. Een proces dat door vele factoren ten tijde van het ophalen beïnvloed wordt. Dit betreft bijvoorbeeld verschillende persoonskenmerken (bijvoorbeeld dissociatie, affect-intensiteit, aandachts-controle, voorstellingsvermogen, fantasiegeneigdheid en huidige psychopathologie), normen en waarden en levenservaring. De wisselwerking tussen deze factoren beïnvloedt de beschikbaarheid van de gebeurtenis in het geheugen, het ophalen en vervolgens de her-opslag in het geheugen. Dit resulteert in een herinnering die in de loop van de tijd kan veranderen (Berntsen, 2010). Kort gezegd: niet zozeer de geheugenprocessen ten tijde van het meemaken van de traumatische gebeurtenis, maar de processen ten tijde van het herinneren van de gebeurtenis zouden volgens het mnemonische model bijdragen aan het ontstaan van intrusies en post-traumatische symptomen. Deze hypothese

wordt ondersteund door studies die rapporteren over gebeurtenissen die eerder niet als traumatisch ervaren zijn en die retrospectief, door iets actueels, als traumatisch ervaren kunnen gaan worden (Engelhard et al., 2019). Het huidige proefschrift gaat nog een stap verder met de vraag of naast reconstructieve geheugenprocessen mogelijk ook constructieve geheugenprocessen kunnen bijdragen aan het ontstaan van intrusies, hetgeen zou kunnen verklaren hoe ook intrusies kunnen ontstaan die verwijzen naar niet zelf-ervaren gebeurtenissen. Om de relevantie van constructieve geheugenprocessen bij intrusies verder te onderzoeken, is het cruciaal om in de eerste plaats meer systematisch vast te stellen in hoeverre indirecte intrusies feitelijk voorkomen. Als eerste stap om te onderzoeken of de incidentele rapportage van indirecte intrusies wel verwijzen naar een robuust fenomeen, heb ik me in dit proefschrift gericht op een groep personen die vanwege hun geschiedenis en ervaringen kwetsbaar lijkt voor het optreden van de veronderstelde constructieve geheugenprocessen en daarmee voor het ervaren van indirecte intrusies. Het onderzoek is daarom gericht op kinderen van ouders die de Tweede Wereldoorlog hebben overleefd. Het door de ouders meegemaakte oorlogsgeweld en de wreedheid hebben ook invloed op de kinderen gehad, terwijl ze zelf de gebeurtenissen niet aan den lijve hebben ondervonden (Betancourt, 2015; Danieli, 1998; Havinga et al., 2017).

De gevolgen van het massale geweld van de Tweede Wereldoorlog is ook na vijfenzeventig jaar nog merkbaar in het dagelijks leven van de overlevenden en van na de oorlog geboren kinderen van overlevenden (de naoorlogse generatie). Hoewel bevolkingsonderzoek geen aanwijzingen vond voor een "naoorlogse generatie-syndroom", werd wel een relatie gezien tussen het gelijktijdig voorkomen van psychische klachten bij Holocaustoverlevenden[10] en psychische klachten bij na de oorlog geboren kinderen. Een meer gedetailleerde analyse van dit verband werd onderzocht en weergegeven in *hoofdstuk 2* met een systematische review van 23 kwantitatieve studies gepubliceerd tussen 2000 en 2018. Vijf factoren die een rol kunnen spelen bij de multicausaliteit van intergenerationele gevolgen zijn geïdentificeerd en geëvalueerd: 1) psychische/mentale gezondheidsproblemen bij ouders, 2) (ervaren) ouderschap en de kwaliteit van de hechtingsrelatie, 3) Holocaustgeschiedenis van de ouder(s), 4) bijkomende stress en life events bij de naoorlogse generatie, 5) cortisol metabolisme, epigenetische invloed en genetische aanleg. Onder andere bleek dat psychische klachten bij ouders, de (negatieve) kwaliteit van de ervaren ouder-kind relatie, twee overlevende ouders vergeleken met één overlevende ouder en een overlevende

10 Hoewel de Duitse bezetting tijdens de Tweede Wereldoorlog veel mensen trof, heeft het meeste, zo niet alle, psychologisch onderzoek naar de intergenerationele gevolgen van de Tweede Wereldoorlog zich gericht op overlevenden van de Holocaust. Daarom is er minder bekend over kinderen die te maken hadden met ouders die andere omstandigheden in de Tweede Wereldoorlog hebben overleefd. Enkele voorbeelden zijn militairen, leden van het verzet, overlevenden van de Japanse interneringskampen in Nederlands-Indië en elders in Zuidoost-Azië, vervolgden om religieuze of politieke redenen en dwangarbeiders.

moeder vergeleken met een overlevende vader gerelateerd waren aan mentale klachten bij de kinderen. Tevens werden aanwijzingen gevonden voor verandering van het cortisolmetabolisme en epigenetische effecten bij deze na de oorlog geboren kinderen. Deze overzichtsstudie heeft laten zien dat er een relatie tussen klachten bij Holocaustoverlevenden en psychische klachten bij hun kinderen kan zijn en dat die relatie slechts begrepen kan worden vanuit een integratief verklaringsmodel waar een grote verscheidenheid aan factoren (psychologische, gezins-, biologische en cultureel-maatschappelijke) bijdragen.

De *hoofdstukken 3, 4 en 5* beschrijven de kwantitatieve en kwalitatieve resultaten van de empirische studie van indirecte en directe intrusies die in dit proefschrift centraal staat. Voor deze studie is een vragenlijst-onderzoek gedaan bij naoorlogsegeneratiepatiënten, dat wil zeggen, na de oorlog geboren kinderen[11] van een of twee ouders die de Duitse of Japanse bezetting tijdens de Tweede Wereldoorlog overleefden en nu volwassen zijn (*N* = 101). De patiënten werden tussen 2011 en 2016 geworven bij een Nederlands centrum gespecialiseerd in de behandeling van aan de Tweede Wereldoorlog-gerelateerde psychologische problematiek. Geëxcludeerd werden patiënten met een actuele (comorbide) diagnose van schizofrenie of een ander psychotische stoornis of actueel alcohol- of drugsgebruik. Op basis van de in- en exclusiecriteria bleef een steekproef van *N* = 98 over met een gemiddelde leeftijd van de patiënten van 56 jaar van wie de meesten hoogopgeleid en van wie 57 % vrouw was. De meest gestelde diagnoses volgens DSM-IV waren stemmingsstoornissen, angststoornissen en persoonlijkheidsstoornissen.

In *hoofdstuk 3* worden het voorkomen, de frequentie en de kenmerken van indirecte intrusies die verwezen naar ervaringen van de ouders tijdens Tweede Wereldoorlog onderzocht en vergeleken met directe intrusies die verwezen naar zelf meegemaakte ervaringen. Als eerste viel op dat intrusies over de oorlog van de ouders inderdaad relatief vaak voorkwamen en dat het percentage participanten dat aangaf indirecte intrusies te ervaren overeenkwam met het percentage participanten met directe intrusies. Ten tweede bleek dat indirecte intrusies vergeleken met directe intrusies overeenkwamen in ervaren levendigheid, intensiteit en oncontroleerbaarheid en zich beide meestal presenteerden als beelden, plaatjes en gedachten die vaak gepaard gingen met sterke lichamelijke reacties. Tenslotte gaven de participanten aan dat ze indirecte intrusies als meer bedacht en verzonnen ervoeren in vergelijking met de directe intrusies die meer ervaren werden zoals ze in werkelijkheid gebeurd waren. De overeenkomsten in frequentie en intrusiekenmerken tussen indirecte en directe intrusies ondersteunen het mnemonisch model waarbij vergelijkbare geheugenprocessen en het (re) constructieve karakter van het geheugen waarbij herinneringen in de loop van de tijd

11 De nakomelingen zijn geboren na de bevrijding (5 mei 1945 in Nederland of 15 augustus 1945 in voormalig Nederlands-Indië) hebben zelf de Tweede Wereldoorlog niet meegemaakt, al vond er in Voormalig Nederlands-Indië na de Japanse capitulatie wel een bevrijdingsoorlog (1945-1949) plaats

worden geconstrueerd en gereconstrueerd een rol spelen.

Hoofdstuk 4 presenteert een kwalitatieve analyse van de inhoud van de gerapporteerde indirecte intrusies bij patiënten uit de naoorlogse generatie. In de meeste intrusies werden visuele beelden van angstaanjagende scènes uit de Tweede Wereldoorlog beschreven zoals de wreedheden in Nazi-concentratiekampen, gaskamers, Japanse interneringskampen en deportaties. Ook werden beelden beschreven van stervende mensen, lijken, geweld, vernedering, ziekte, verhongering en het gescheiden worden van familieleden. Tevens bevatten de intrusies vaak emoties (meestal angst, vrees en kwetsbaarheid) en werden ze meestal vanuit het eerste-persoonsperspectief verteld. De volgende uitspraken illustreren dit: "ik loop door het kamp…." (geeft aan dat de participanten een van de aanwezigen in de intrusie was) en "ik voel mijn vaders paniek…." (geeft aan dat de participanten zich in de intrusie identificeerde met de ouder). De beschrijvingen van de indirecte intrusies bestonden meestal uit een kort fragment van een afschrikwekkende gebeurtenis, bijna zoals een foto, in plaats van een volledig verhaal met een begin, midden ("*worst moment*") en einde.

De volgende vraag - welke individuele kenmerken van de participanten hebben invloed op het krijgen van intrusies? - wordt in *hoofdstuk 5* besproken. De samenhang van de factoren gender, opleidingsniveau, dissociatie, affect-intensiteit, aandachts-controle, voorstellingsvermogen, fantasiegeneigdheid (*fantasy proneness*) en huidige psychopathologie met indirecte intrusies werd vergeleken met de samenhang tussen deze factoren met directe intrusies. Het bleek dat fantasiegeneigdheid een statistisch significante en unieke associatie met indirecte intrusies vormde, welke niet werd gevonden bij directe intrusies. Dissociatie en actuele psychopathologie (waaronder algemene angst- en traumagerelateerde vermijding en opwinding) werden in vergelijkbare mate genoemd bij indirecte en directe intrusies. Mannen en vrouwen rapporteerden even vaak indirecte intrusies, terwijl vrouwen vaker directe intrusies hadden dan mannen. Ten slotte rapporteerden mensen met directe intrusies intensere depressiesymptomen dan degenen zonder. Dit verschil werd niet gevonden voor mensen met indirecte intrusies. Deze bevindingen zijn in overeenstemming met het idee dat intrusies mede beïnvloed worden door kenmerken van het individu. De unieke correlatie van fantasiegeneigdheid met indirecte intrusies kan worden verklaard op basis van het mnemonisch model waarin intrusies worden gezien als het resultaat van een (re)constructief proces dat door verschillende individuele kenmerken beïnvloed wordt.

In *hoofdstuk 6* zijn de belangrijkste thema's samengevat en de sterke kanten en beperkingen van dit proefschrift besproken. Vervolgens werden de theoretische en klinische implicaties en implicaties voor vervolgonderzoek besproken. Sterk van het hier beschreven onderzoek is de mixed methods benadering waarbij kwantitatieve en kwalitatieve analyses van intrusies en participanten gecombineerd zijn. Een beperking van het onderzoek is dat de bevindingen niet gegeneraliseerd kunnen worden naar de gehele naoorlogse generatie aangezien de onderzoekspopulatie bestond uit een

groep patiënten in behandeling voor psychische problemen. Een andere beperking is dat er geen informatie beschikbaar was over psychische klachten van ouders en hoe er in het gezin over de oorlog gecommuniceerd werd.

De meeste theoretische modellen kunnen de aanwezigheid van indirecte intrusies niet verklaren omdat die uitgaan van een afwijkende opslag in het geheugen van zelf-meegemaakte gebeurtenissen. Indirecte intrusies kunnen wel door het mnemonische model verklaard worden omdat dit model uitgaat van algemene geheugenprocessen onafhankelijk van het soort gebeurtenis waarbij de nadruk ligt op het terughalen, weer herinneren, van een gebeurtenis. De kenmerken en frequentie van voorkomen van indirecte en directe intrusies bleken sterk overeen te komen. Dit is in overeenstemming met het idee dat vergelijkbare processen betrokken zijn bij het ontstaan van indirecte en directe intrusies en suggereert dat het mnemonisch model zowel op indirecte als directe intrusies toepasbaar is. De overeenkomsten tussen de individuele persoonskenmerken van de participanten voor beide soorten intrusies en de bevinding dat fantasiegeneigdheid specifiek gerelateerd was aan de aanwezigheid/frequentie van indirecte intrusies is eveneens in overeenstemming met het mnemonisch model. Deze bevinding sluit aan bij ander recent trauma-onderzoek met behulp van Virtual Reality (VR) dat laat zien dat intrusies kunnen variëren van vrijwel een replicatie van de gebeurtenis tot een (re)constructie waarbij delen of aspecten van de gebeurtenis veranderd zijn (Berntsen & Nielsen, 2021; Nielsen et al., 2020). Fantasiegeneigdheid kent twee subtypen, namelijk creatieve fantasie (fantasie gebruiken om nieuwe ideeën te ontwikkelen) en imaginatieve fantasie (levendig kunnen voorstellen en verliezen in dagdromen) (Weibel et al., 2018) Welke van de twee of beide subtype interfereren met de geheugenprocessen in de context van intrusies moet verder onderzocht worden.

De link van deze indirecte intrusies met fantasiegeneigdheid kan enerzijds een nadeel zijn, aangezien deze mogelijk impliceert dat creatieve mensen gevoeliger zijn voor het ontwikkelen van indirecte intrusies. Echter, deze link zou ook voor deze mensen in hun voordeel kunnen werken, omdat het vermogen om fantasie te gebruiken behulpzaam kan zijn bij het veranderen van mentale representaties zoals bijvoorbeeld bij *imaginary rescripting*. Dit is een psychotherapeutische techniek waarbij intrusies worden gereconstrueerd (als het ware herschreven) naar een minder beangstigend beeld. Op deze manier kan de negatieve impact van de intrusie verminderen (Arntz 2012; Rijkeboer 2020; Strohm et al., 2019). Overigens heeft de bevinding dat indirecte intrusies over de Tweede Wereldoorlog voorkomen bij kinderen die de oorlog niet meegemaakt hebben, maar hun ouders wel, ook andere implicaties voor de klinische praktijk. Deze intrusieve beelden zijn beangstigende voorstellingen met huiveringwekkende details en kunnen logischerwijs gepaard gaan met psychische klachten zoals angst en depressie. Ondanks dat op basis van dit onderzoek niet duidelijk is of de intrusies oorzaak of gevolg zijn van de psychologische klachten, is het aan te bevelen om er bij patiënten van de naoorlogse generatie naar te vragen en

mogelijk verdere behandeling op in te richten.

Dit proefschrift heeft aangetoond dat indirecte intrusies over de Tweede Wereldoorlog voorkomen bij na de oorlog geboren kinderen van overlevenden die kampen met psychische problemen. De frequentie en kenmerken van indirecte intrusies zijn vergelijkbaar met die van directe intrusies. Individuele eigenschappen, met name fantasiegeneigdheid, spelen mogelijk een rol bij het ontstaan van indirecte intrusies. Bovendien kan de inhoud van de intrusies gruwelijk zijn en gepaard gaan met emoties. De hoge prevalentie van intrusies over de oorlogservaringen van de ouders bij deze patiënten is een sterke indicatie voor gevolgen van negatieve gebeurtenissen op de langere termijn en spoort aan tot alertheid ook bij niet-primair getroffenen. Er is geen reden om aan te nemen dat kinderen met psychische klachten van overlevenden van andere oorlogen, bijvoorbeeld die uit Afghanistan, Syrië, Rwanda, Oekraïne, of kinderen van slachtoffers van huiselijk of werk-gerelateerd geweld hiertegen beschermd zullen zijn. Verder onderzoek is dus nodig om meer inzicht te krijgen in de mechanismen van intergenerationele gevolgen van psychotrauma, om uiteindelijk beter in staat te zijn de negatieve impact van gruwelijke ervaringen van ouders op hun kinderen zo snel mogelijk te stoppen en bijkomende schade op de lange termijn zoveel mogelijk te beperken.

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A

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Patricia Dashorst (1960) received her medical degree at Amsterdam University in 1987. She was a psychiatrist resident at Zon en Schild (now known as GGZ Centraal) in Amersfoort, ARQ Centrum'45 in Oegstgeest, and completed her training in 1995 at Sinai Center in Amsterdam. In 2011 she finished her training as a family therapist and in 2013 as a trauma psychotherapist. Since 1995 she is affiliated as a psychiatrist with ARQ Centrum'45 in Oegstgeest. ARQ Centrum'45 partner in ARQ National Psychotrauma Centre for customised care, advise and knowledge. She works in the outpatients' clinic and is engaged in a day treatment of World War Two survivors, World War Two survivor offspring, veterans, and police personnel. She supervises psychiatrist residents, trainees in family therapy, and in Brief Eclectic Psychotherapy for PTSD. In 2015 she started her PhD project at the University of Groningen next to her work as psychiatrist at ARQ Centrum'45.

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Patricia Dashorst

Unraveling intrusions

Traumatic events as happen in the context of the violence of war may cause the occurrence of intrusions – images or thoughts of such a traumatic event that arise spontaneously and involuntarily. This PhD thesis demonstrates that people can also experience intrusions about events they have not witnessed themselves. Thus, it emerged that a group of children who were born after the war to World War Two survivors and who were in treatment for mental complaints experienced intrusions about the Second World War.

As to the content of these indirect intrusions, it transpired that they often include visual images of horrendous scenes from the Second World War; moreover, they could be accompanied by feelings of fear and depression. The frequency of these indirect intrusions was found to be relatively high in people with a relatively high fantasy proneness. Moreover, the frequency and characteristics of indirect intrusions were similar to those of direct intrusions about traumatic events that were self-experienced.

Current models of intrusions attribute a crucial role to specific memory processes occurring during the traumatic events. However, these models cannot account for indirect intrusions since these concern events that the person involved did not witness themselves. Yet indirect intrusions can be explained through the more general mnemonic memory model, which lays emphasis on (re)constructive processes as memories are retrieved and stored again independently of the actual event. In this thesis, the significance of this memory model for explaining the occurrence of intrusions is being discussed.

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